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ENVIRONMENTAL ASSESSMENT BOARD



ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 61

DATE: Thursday, September 19, 1991

BEFORE:

HON. MR. JUSTICE E. SAUNDERS Chairman


DR. G. CONNELL Member

MS. G. PATTERSON Member

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,
R.S.O. 1980, c. 140, as amended, and Regulations
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro
consisting of a program in respect of activities
associated with meeting future electricity
requirements in Ontario.

Held on the 5th Floor, 2200
Yonge Street, Toronto, Ontario,
on Thursday, the 19th day of September,
1991, commencing at 10:00 a.m.

VOLUME 61

B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

S T A F F :

MR. M. HARPUR	Board Counsel
MR. R. NUNN	Counsel/Manager, Information Systems
MS. C. MARTIN	Administrative Coordinator
MS. G. MORRISON	Executive Coordinator

A P P E A R A N C E S

(Cont'd)

H. POCH)	CITY OF TORONTO
J. PARKINSON)	
R. POWER		CITY OF TORONTO, SOUTH BRUCE ECONOMIC CORP.
S. THOMPSON		ONTARIO FEDERATION OF AGRICULTURE
B. BODNER		CONSUMERS GAS
J. MONGER)	CAC (ONTARIO)
K. ROSENBERG)	
C. GATES)	
W. TRIVETT		RON HUNTER
M. KLIPPENSTEIN		POLLUTION PROBE
N. KLEER)	NAN/TREATY #3/TEME-AUGAMA
J. OLTHUIS)	ANISHNABAI AND MOOSE RIVER/
J. CASTRILLI)	JAMES BAY COALITION
T. HILL		TOWN OF NEWCASTLE
M. OMATSU)	OMAA
B. ALLISON)	
C. REID)	
E. LOCKERBY		AECL
C. SPOEL)	CANADIAN VOICE OF WOMEN
U. FRANKLIN)	FOR PEACE
B. CARR)	
F. MACKESY		ON HER OWN BEHALF
D. HUNTER		DOFASCO
B. TAYLOR)	MOOSONEE DEVELOPMENT AREA
D. HORNER)	BOARD AND CHAMBER OF COMMERCE

I N D E X o f P R O C E E D I N G S

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<u>AMIR SHALABY,</u>	
<u>MARION ELIZABETH FRASER,</u>	
<u>LYN DOUGLAS WILSON,</u>	
<u>WILLIAM OSBORNE HARPER,</u>	
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1 ---Upon commencing at 10:03 a.m.

2 THE REGISTRAR: Please come to order.

3 This hearing is now in session. Be seated, please.

4 THE CHAIRMAN: Mr. Rodger?

5 MR. RODGER: Thank you, Mr. Chairman.

6 PAUL JONATHAN BURKE,
7 AMIR SHALABY,
8 MARION ELIZABETH FRASER,
9 LYN DOUGLAS WILSON,
WILLIAM OSBORNE HARPER,
IAN DUNCAN MacLELLAN; Resumed.

10 CROSS-EXAMINATION BY MR. RODGER (cont'd):

11 Q. Panel, when we left off yesterday we
12 had just started to talk about some of the specific
13 programs with respect to the residential sector, and I
14 would like to turn now to heat pumps in that sector.

15 I wonder if you could turn to page 9,
16 please, of Exhibit 304, which is Table 8 from Exhibit
17 25, page B20. The fifth column from the bottom deals
18 with ground source heat pumps. You see if you go over
19 three columns that the energy reduction is 60 per cent.

20 Now, if you flip over to the next page,
21 page 10, which is an excerpt from Exhibit 76, Appendix
22 A3 -- I'm sorry, that should be page 11, Appendix A2.
23 Up at the top the technology is ground source heat
24 pumps and it is reduced to 50 per cent.

25 Mr. Burke, is this revision based also on

1 your comments of yesterday that now you have direct
2 experience with results from various studies, that was
3 the reason for this adjustment?

4 MR. BURKE: A. Well, one of the
5 contributing factors to the difference is that in
6 Exhibit 76 a mixture of heat pumps is, on average,
7 saving 7,800 kilowatthours a year, or up to 50 per
8 cent, whereas in Exhibit 25 the reference is
9 specifically to ground source heat pumps which tend to
10 save somewhat more energy than air source heat pumps.

11 So, to the extent that there is air
12 source heat pumps in the mix, that dilutes the average
13 savings from the heat pump technology.

14 Q. The up to 50 per cent savings found
15 on page 11 on Appendix A2, is that your current
16 estimate of the savings or has that figure changed?

17 A. No, no, that's the current estimate,
18 but I am saying that is a weighted average of the
19 savings for the three technologies listed.

20 Q. So ground source is the most
21 efficient?

22 A. Yes, saves the highest proportion.

23 I can confirm this after the break if you
24 want, but I would think the ground source by itself is
25 more than 50 per cent saving.

1 MR. MacLELLAN: A. The ground source
2 would be the 60 per cent figure mentioned in Exhibit
3 25; air source would be about a savings of 40 per cent.
4 That's approximately where the 50 per cent average
5 would come from.

6 Q. I see. If we go back to page 9 of
7 that same exhibit, and staying with ground source heat
8 pumps, we see that in '89 dollars, the range of capital
9 costs for that technology ranges from 3,000 to \$6,000.
10 And there is a payback of period of 6 to 10 years,
11 which is the fourth last column to the right.

12 MR. BURKE: A. I am sorry, are we on the
13 same page?

14 Q. This is page 9, which is Table 8 from
15 Exhibit 25.

16 A. I see. Looking across all of the
17 heat pumps now?

18 Q. Yes.

19 A. I see.

20 Q. Now, if we could turn to page 10,
21 which is the excerpt from Exhibit 76.

22 MS. PATTERSON: Excuse me, Mr. Rodger. I
23 don't think those numbers you gave are the ones that I
24 see. Am I missing something? This is under ground
25 source heat pumps?

1 MR. RODGER: Yes.

2 MS. PATTERSON: And then you said fourth
3 column from the right, customer payback years?

4 MR. RODGER: Yes. And if you go down the
5 first ground source heat pump, SH, is ten years, and
6 the burner-assisted heat pump is six years.

7 MS. PATTERSON: Okay. Thanks.

8 MR. MacLELLAN: The burner-assisted heat
9 pump is not a type of ground source heat pump, just so
10 we know we are comparing apples and apples here.

11 MR. RODGER: Q. So the appropriate
12 figure is the nine or ten year for ground source heat
13 pump?

14 MR. MacLELLAN: A. Yes. On page 9 there
15 are three lines there, the first is for the space
16 heating portion of a ground source heat pump; the
17 second line is ground source heat pump that provides
18 space and water heating, the SH and WH; the third is
19 burner-assisted heat pump which is a type of air source
20 heat pump that has propane or natural gas as a back up.
21 It's not a ground source.

22 Q. Okay. If we go to page 10, an
23 excerpt from Exhibit 76, Appendix A3. Again, under the
24 heading Segment, the second heading is Heating System,
25 which are heat pumps, ground source, air source, and if

1 you go over four columns we will see that that customer
2 payback period is now fourteen years.

3 I wonder if you could tell me, what is
4 the amount of the incentive that is currently being
5 provided in the case of this particular heat pump with
6 a fourteen year payback?

7 A. For a ground source heat pump the
8 incentive is 2,000, for an air source heat pump the
9 incentive is \$500, and for a bi-valent or
10 burner-assisted, they are the same thing, the incentive
11 is \$1,000. All of those are available only in non-gas
12 areas.

13 Q. Now, for the ground source heat pump,
14 the \$2,000 incentive, what is the total capital cost of
15 that particular technology?

16 A. The total or the incremental?

17 Q. The total.

18 A. Approximately \$10,000.

19 Q. So, in this case, if I understand it
20 correctly, Hydro is giving an incentive of \$2,000, it's
21 going to cost the customer \$10,000, and we are talking
22 about a fourteen year payback; is that correct?

23 A. The payback is before the incentive.

24 Q. What is it after?

25 A. Hang on. It must be here somewhere.

1 About seven years.

2 Q. Now, in your direct evidence you
3 stated that anything longer than a three year payback
4 after the incentive, that was a real problem for most
5 consumers. Given this technology, although it
6 potentially has a lot of savings, how confident are you
7 that consumers will take on that capital expenditure
8 given the length of the payback period?

9 A. We are reasonably confident,
10 particularly given program results to date. Sales of
11 ground source heat pumps have increased dramatically
12 over the last year-and-a-half in Ontario, and as a
13 result of those sales, we are quite confident that our
14 targets will be hit in that technology.

15 Q. So, when you testified earlier on
16 that more than a three year payback period was a real
17 barrier, is that number now changing? Is there a
18 longer payback period, or is this ground source heat
19 pump an exceptional situation?

20 A. I believe three years was used as a
21 rule of thumb. With some commodity-type products that
22 are just bought off the shelf, the payback period has
23 to be under a year in residential. With others, like a
24 ground source heat pump or even an R2000 home, for
25 example, where the savings are quite extended, then the

payback period can be longer.

Q. Now, Mr. MacLellan, you said just now that the ground source heat pump incentive, that wasn't available in areas where natural gas is available. Did I hear you correctly?

A. Correct.

Q. Do you recall that yesterday we established that one of the broad societal goals that we are trying to achieve is overall energy reductions. And I am wondering, keeping that goal in mind, and given the tremendous amount of savings that ground source heat pumps represent, why aren't incentives for that technology also being given in the areas served by natural gas?

A. What we wanted to avoid was anybody switching from gas to an electric heating system because of an incentive that we were offering.

• • •

1 [10:15 a.m.] What we are really trying to do is, in
2 areas where people don't have a lot of choice and will
3 probably choose electric heating anyway, we want to
4 make that choice the most efficient system possible.
5 That is the rationale for our incentives for this kind
6 of technology, or heat pumps generally in non-gas
7 areas.

8 If you look at the cost-effectiveness of
9 a ground source heat pump where gas is available,
10 versus high-efficiency gas furnace, the savings are not
11 quite as dramatic, nowhere near as dramatic as if you
12 compare it to a resistance electric system. So, we
13 wouldn't really advocate ground source technologies
14 where gas is available, because the payback period is
15 quite long.

16 Q. Although that would go towards
17 achieving our broad goal that we talked about yesterday
18 of overall energy reduction, wouldn't it?

19 A. Ground source system is slightly more
20 efficient than a high-efficiency gas unit in that
21 context, yes.

22 Q. I'd like to turn now to the R2000
23 program. Now, with regard to new houses, the capital
24 costs of the R2000 home and heat pumps, they must be
25 incorporated by the developer into the price of the

1 house. Would you agree that the incentives for this
2 program, they must be directed in the first case
3 immediately towards the developer. They must be
4 convinced that the substantial additional capital costs
5 can be passed on to the eventual final purchaser, the
6 customer, would you agree with that?

7 A. Yes.

8 Q. And secondly, towards the ultimate
9 consumer, who must be prepared to accept higher
10 additional capital costs in the interest of lower
11 future energy costs?

12 A. Right. In the new housing market, it
13 can be kind of a chicken and egg situation. The
14 builders have to be convinced the consumers want it,
15 and consumers have to be made aware of the availability
16 of that kind of technology.

17 Q. Now yesterday we spent a good deal of
18 time talking about how decision-makers decide. Could
19 you tell me what Hydro's understanding is of how
20 developers rank these energy-efficient features against
21 other competing features that developers rely upon to
22 market their homes?

23 A. Developers and builders generally
24 feel that the energy efficiency of a home is not as
25 much of a concern to home buyers as is a nice bathroom,

1 great appliances in the kitchen, a nice marble front
2 foyer, things like that. Those tend to be the real
3 marketing tools the builders use. That's why our
4 marketing program for the R2000 area has to be focused
5 on making consumers aware of the benefits of an energy
6 efficient home and cause them to ask their builders for
7 it.

8 Q. How would is Hydro going about, once
9 again, the idea of changing peoples' behaviour, at
10 least changing peoples' outlook as to what they should
11 be spending their money on in terms of a new house?

12 A. Well, we started about a
13 year-and-a-half ago with a marketing program intended
14 to make them aware of the features of an R2000 home.
15 Our research since then has shown that they are aware
16 of the features. That doesn't necessarily cause them
17 to purchase. There seem to be more barriers in the
18 marketplace to builders actually building R2000 homes.

19 That was the reason for our change in
20 this incentive program at the beginning of this year.
21 Originally the incentive was \$2,000 to a homeowner and
22 \$500 to a builder. What we found through program
23 results and through research was that that \$500 to the
24 builder wasn't enough. His out-of-pocket incremental
25 costs were substantially more than that.

1 We have now increased the incentive for
2 builders to \$2,000. That makes it worth the builder's
3 while to get the R2000 training, to make sure that his
4 subtrades are all trained in R2000 building techniques,
5 and to actually market the program, market the houses
6 as R2000.

7 The builders also see Ontario Hydro's
8 R2000 promotions as a substantial benefit to their
9 business. So, they are eager to participate in the
10 program, because they believe consumer interest and
11 receptiveness for that kind of a technology will
12 increase.

13 Q. So for builders, it's been a
14 four-fold increase in terms of the amount of the
15 incentive. What currently is the total capital cost of
16 the R2000 program?

17 A. It's about a \$6,000 incremental cost
18 over a standard building code home.

19 Q. Has the incentive also raised for the
20 ultimate consumer?

21 A. No, the consumer incentive was left
22 the same.

23 Q. And that's \$2,000?

24 A. \$2,000.

25 Q. Now, back to page 9 of Exhibit 304.

1 And on the left-hand column, the fourth technology from
2 the bottom is the Ontario Building Code R2000 home.
3 Again, if we go along to the customer payback in years
4 for that technology, that was given at nine years.

5 A. Yes.

6 Q. On page 10 to Exhibit 76, and you
7 will see under "Segment," the third heading is new
8 housing, which is the R2000 end-use technology, and we
9 will see now that the payback period has been increased
10 to thirteen years.

11 Now, throughout these two exhibits, 25
12 and 76, the capital costs are seen as unchanged in '89
13 dollars, which shows \$6,000.

14 Can I ask you, is the longer payback
15 period, and the fact that the capital costs have not
16 changed, is this the result of substantially lower
17 estimated energy savings for this technology?

18 MR. BURKE: A. The per cent savings are
19 the same, but I think if you observe in the second
20 column of each of the tables, the averaging of energy
21 consumption of the base case, the house itself - that
22 is the Ontario Building Code 1986 house - before you
23 apply the R2000 technology, in Exhibit 25 is listed as
24 19,900 kilowatthours a year.

25 Q. Yes.

1 A. Whereas in Exhibit 76, the value
2 given is -- oh, it doesn't give the average here. No,
3 its not there.

4 The value is 15,300. That is in the 1990
5 basic load forecast. And essentially what has happened
6 is that the estimate of the year 2000 -- well, two
7 things have happened. First of all, the results we
8 have from the 1,000 home survey indicate that the
9 general level of space heating use, energy use in
10 electrically heated houses is lower than we previously
11 thought, and also the -- I guess the presumed further
12 efficiency gain over the period from 1990 to 2000 in
13 the base case level of new construction has been
14 increased since the 1988 load forecast.

15 The combination of the two has led us to
16 reduce significantly the base value of the electric
17 space heating energy consumption for the year 2000.
18 And so the savings remain at 50 per cent. The cost is
19 the same. And if anything, that is the surprising
20 part, that perhaps -- essentially we are dealing with
21 another case where we didn't have very good data on the
22 use of space heating in new electrically heated houses,
23 and with the information from the 1,000 home survey, we
24 have a much better estimate now to work with.

25 Space heating load by itself is not

1 metered typically. It is the whole house that is
2 metered, and so one has to go to some effort to
3 actually decompose the total house load to estimate the
4 electric space heating portion, and we think we now
5 have a better estimate.

6 MR. MacLELLAN: A. We are currently
7 refining our number on the incremental cost since the
8 building code change, which happened late 1990, and it
9 looks like it will come down from \$6,000. But we are
10 just now gathering more detailed information from
11 builders.

12 THE CHAIRMAN: Just so I'm clear, is the
13 thirteen year payback before or after the incentives?

14 MR. MacLELLAN: Before.

15 MR. RODGER: Q. And with the R2000,
16 what's the payback period after the incentive?

17 MR. MacLELLAN: A. After the builder and
18 consumer incentive, it is slightly over five years.

19 Q. So once again we are over that three
20 year threshold that --

21 A. Over the three year rule of thumb,
22 not threshold.

23 Q. Three year rule of thumb.

24 Mr. MacLellan, since this program has
25 been offered in new houses, how can you can be that it

1 is not attracting developers away from the installing
2 of gas heating and putting in electricity heating and
3 therefore increasing the demand?

4 A. This program is also only available
5 in non-gas areas.

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25 ...

1 [10:20 a.m.] We did a survey, I guess it was late last
2 year, of all the R2000 homes built in Ontario, and
3 there were, of 300 homes built, there were only a few
4 electrically heated R2000 homes in gas areas.

5 So, according to the research, that's not
6 happening.

7 What we would like to happen, what we
8 actually need in this industry is a little bit of a
9 critical mass. We need more builders trained, we need
10 more trained subcontractors. We would really like the
11 gas company to assist in this business. So, that would
12 really help the whole industry and get the general
13 housing level upgraded.

14 Q. Have you approached the gas industry
15 about that specific issue?

16 A. We have had some informal talks.

17 Q. And do you anticipate that something
18 concrete will be coming out of that in the near future
19 or is it just too early to tell?

20 A. Too early to tell.

21 Q. I wonder if you could turn to page
22 12, please, of Exhibit 304, and this is taken from
23 Exhibit 25, Table 3, on page B5. I want to look at the
24 lifecycle costs and avoided costs of the R2000 program.
25 You will see, under the technology column, three up

1 from the bottom is the R2000. I want to understand the
2 comparison of avoided costs to lifecycle costs in the
3 context this program and of benefit cost analysis.

4 What I have done, if you go over to the
5 avoided cost column of R2000, you see that is 6.53, and
6 the lifecycle cost is 3.20. I have taken the avoided
7 cost number, divided it by the lifecycle cost, and I
8 get a benefit cost ratio of roughly 2 to 1.

9 Do you follow that, Mr. Burke?

10 MR. BURKE: A. I follow. Is it written
11 down anywhere? No. Sure, take the ratio. That is
12 fine.

13 Q. Now, if we go over to page 13, which
14 is taken from Exhibit 76, page 31, and we go down about
15 half of that column we see the R2000 home again, and
16 under lifecycle cost and avoided cost the numbers are
17 changed. The avoided cost is now 6.6 cents a
18 kilowatthour and the lifecycle costs are 4.6 cents a
19 kilowatthour. I look at that benefit cost ratio and it
20 is down now to about 1.4 to 1.

21 If we go over one more page, page 14, and
22 that's from Exhibit 260, which is the demand management
23 tests used at Hydro in 1990 dollars for the R2000
24 program, and under the first heading, Total Customer
25 Test, the benefit cost ratio is slightly greater than

1 one. So over time the benefits are getting less and
2 less.

3 Now, is my understanding correct when I
4 say that the successive reductions indicate less
5 optimism with respect to this program?

6 A. No. I think we can explain each of
7 these stages to you.

8 The difference between Exhibit 25 and
9 Exhibit 76, as you note, the avoided costs are almost
10 identical between the two studies; what has changed is
11 the lifecycle cost, and that's a direct result of
12 maintaining the same capital cost but getting lower
13 energy savings, and that, as we just discussed, is a
14 result of the fact that the house itself, while still
15 saving 50 per cent of the energy, the house doesn't
16 consume as much energy, so the savings have been
17 reduced about -- well, 30 per cent from the values used
18 in Exhibit 25. They have gone from, turning back to
19 page 9, 10,400 kilowatthours, down to 7,700
20 kilowatthours in Exhibit 76. So, that is what has
21 caused the lifecycle cost to rise.

22 Now, should, as Mr. MacLellan indicated,
23 it be appropriate to reduce the capital cost of this
24 measure at some point in the future, we might see the
25 lifecycle cost actually falling again, and so the ratio

1 moving up.

2 Now, what we have in this analysis is
3 essentially the cost of the technologies in a pretty
4 pure form. I will maybe make this subject to checking
5 with staff, but my understanding is that there are no
6 program costs or issues associated with program
7 delivery contained in numbers in Exhibit 76. There
8 could be a flat \$350 a kilowatt kind of figure built in
9 as an imputed typical program cost. But the table you
10 showed us on page 14 is a screen for the R2000 program,
11 and I think that is a slightly more complicated
12 analysis.

13 Maybe Mr. MacLellan could indicate some
14 of the additional considerations that are included in
15 the screen of the program as opposed to the screen of
16 the technology for potential.

17 Q. Mr. Burke, before Mr. MacLellan
18 answers, I was unclear of what wasn't included in
19 those. You said there was a cost that might not be
20 included.

21 A. We haven't included explicit
22 estimates of free ridership in the estimates of
23 potential here.

24 Essentially, we are screening the
25 technologies per se. The issue of incentives and all

1 that sort of thing hinges -- and how much we can
2 afford, hinges perhaps on the free ridership that might
3 be expected. But whether the technology is economic,
4 that's essentially what is being tested in the
5 potential here. And tests of the technology are
6 different from tests of the program ultimately that
7 delivers the technology.

8 I don't know whether I put Mr. MacLellan
9 on the spot or not. But my sense is that the reason
10 there would be a difference between your page 13 and
11 page 14 is in the differences associated with the costs
12 of delivering the program as opposed to the technology
13 as handled here.

14 I would like to perhaps reserve the
15 possibility of coming back to give you exactly what
16 types of generalized program costs are included in this
17 estimate here, because there is some consideration of
18 administrative costs of programs in these potential
19 estimates but it may not correspond exactly to what
20 actually comes down the pike in a program.

21 Q. Just one more point, Mr. Burke, I
22 haven't talked about free ridership yet, I am going to
23 leave that until later on, but if you haven't included
24 the potential for free riders in this program, wouldn't
25 that also have the effect of lowering the benefit cost

1 ratio?

2 A. No. The way it's treated in the
3 potential study is that the technology is rated against
4 the baseline load forecast assumptions which include
5 natural conservation; that is, the general improvement
6 in efficiency that goes on without Hydro's programs.
7 So that what we have here as the base case is the
8 Ontario Building Code and the adoption of it by all
9 customers.

10 The very small proportion of the
11 population that would take up R2000 houses by
12 themselves isn't particularly reflected in this
13 analysis.

14 I don't know. I am not claiming it makes
15 a difference to the program. I am not really informed
16 about how free riders have effected the estimate of
17 program costs. But in principle the potential numbers
18 don't consider the number design because we don't have
19 programs for all of what we are planning to do to 2000,
20 2015 and so on, but they do take into account the
21 estimates in the load forecasts of natural
22 conservation.

23 Q. Mr. MacLellan?

24 MR. MacLELLAN: A. As was stated in
25 direct evidence, that's the reason why we do this kind

1 of screening both at the potential level where Mr.
2 Burke is involved and at the program design level where
3 we are involved.

4 We take a program and try to paint a
5 scenario of a program delivery over three years, five
6 years, whatever length of time we decide for our
7 program, and we add in all the delivery and
8 administrative costs, things like developing the
9 builder infrastructure, setting up the training, making
10 sure that there is enough testing facilities, all of
11 the costs involved. That's why we run it at that point
12 through the DS Strategist program, to make sure that
13 there still is a positive net benefit in the total
14 customer cost area.

15 Q. Would I be correct then, Mr.
16 MacLellan, that on page 14 from Exhibit 260, doesn't
17 this show the truest benefit cost ratio since it does
18 incorporate all those other factors?

19 A. For actual program delivery it shows
20 the true benefit cost ratio.

21 Q. I wonder if you could turn now to
22 Exhibit 307, which is the Ontario Hydro survey of
23 December 1988, "Approach to Determine the Impact of
24 Demand Management Activities on the Market Share of New
25 Electrically Heated Homes." I would like to take a

1 little time to go through this.

2 THE CHAIRMAN: Have you mentioned a page
3 yet?

4 MR. RODGER: No. Does the panel have it?

5 THE CHAIRMAN: Yes, we have it. Thanks.

6 MR. RODGER: Q. The first page of the
7 survey is a letter, and this describes, about halfway
8 down the first paragraph that:

9 "The findings from this study will be
10 used to support the program design for
11 the R2000 financial incentive plan."

12 And the next paragraph, the second
13 sentence says:

14 "One of the major findings was that
15 traditional gas builders are unlikely to
16 alter their fuel choice from gas to
17 electric in an R2000 home for a level of
18 incentive up to \$4,000."

19 Now, I take it from the evidence of the
20 past few days, this is no longer an aim of Ontario
21 Hydro in terms of switching of a fuel choice from gas
22 to electric.

23 MR. MacLELLAN: A. No, definitely not.

24 The research was done to find out the
25 threshold of incentive level so that we could prevent

1 that.

2 Q. If you go to page 4 of the survey,
3 and in the first bullet, the last sentence, a sampling
4 of builders and developers across the province, was
5 kind of the target group. I take it that surveys like
6 this are a part of Hydro's ongoing efforts, as we were
7 talking yesterday, in ascertaining how decision-makers
8 make decisions; is that correct?

9 A. Yes. This survey was done very early
10 in the program design stage, as you can see, back in
11 1988.

12 Q. On the next page, page 5, the heading
13 is, "Influencing Factors for Energy Decisions," and
14 with respect to the selection of heating systems, the
15 bullets say that the builder/developer is the major
16 decision-maker, and that:

17 "Homeowner involvement in decision
18 process is directly proportional to the
19 type of construction, relationship to
20 builder, size of builder and capital cost
21 required to add energy-efficient
22 technologies."

23 Is this still applicable today in terms
24 of targeting those groups?

25 A. Yes.

1 Q. Now, if you go to page 21, please.

2 This gives part of the study findings, and it talks
3 about gas utilities. The first bullet indicates that
4 they are very aggressive in promoting the use of gas,
5 and it goes on and talks about money spent in
6 advertising by the gas industry. At the very bottom
7 point:

8 "The gas utilities will be very
9 focused in spending promotional dollars
10 to protect and build their rate base."
11 Then it gives an example, the anti-heat
12 pump campaign by Union Gas.

13 Has anyone on the panel got any knowledge
14 of this, that could describe this campaign?

15 A. No, I don't.

16 Q. Would you agree that such a campaign,
17 that goes against, once again, our broad societal
18 objective of reducing overall energy savings by trying
19 to perhaps in this case force out a more efficient
20 technology?

21 A. Do you mean the gas company is going
22 against this broader societal goal?

23 Q. Yes, this broader societal goal that
24 we talked about.

25 A. They would be really promoting high

1 efficiency gas furnaces against heat pumps, and when
2 they are doing that, they are actually, in gas areas,
3 they are promoting a less costly heating system in
4 general. So, it all depends on your definition of
5 efficiency, I guess.

...

1 [10:40 a.m.] Q. So you don't see any conflict with an
2 anti-heat pump campaign by a gas company and our broad
3 goal?

4 MR. B. CAMPBELL: Well, is that a
5 hypothetical? I think he's indicated he doesn't have
6 any knowledge of such a campaign.

7 MR. RODGER: Q. Should I make it more
8 explicit, or you have answered it fully?

9 MR. MacLELLAN: A. I think if the gas
10 company was conducting an anti-heat pump campaign and
11 attempting to install standard efficiency gas furnaces,
12 then your point may be well taken. But I can't really
13 assume what the gas company's intent was.

14 Q. Okay, that's fine.

15 The next page 22, there are findings with
16 respect to a comparison of Hydro and gas utilities. It
17 reads:

18 "In comparison to the gas utilities,
19 the builders consider Ontario Hydro to be
20 bureaucratic and difficult to work with
21 effectively. Local offices lack
22 autonomy, little promotion funding
23 available to builders, municipal PUCs
24 often appear to be working in conflict
25 with Ontario Hydro policies. Example,

1 hot water heater rentals."

2 Could you explain why that example was
3 given, the hot water heater rentals? What was the --

4 MR. B. CAMPBELL: Mr. Chairman, how can
5 these witnesses know? They didn't conduct the survey.
6 Presumably this is the example that the surveying
7 company was given when it conducted the survey by the
8 respondents, but I don't see how any of these witnesses
9 could possibly know why this example was picked by
10 Arthur D. Little.

11 THE CHAIRMAN: Well, they might know what
12 the problem is with municipal utilities concerning hot
13 water heater rentals. If they do, they can say so. If
14 they don't, they can say they don't know.

15 MR. B. CAMPBELL: That question I have no
16 objection to.

17 THE CHAIRMAN: It is a different way of
18 asking the same question.

19 MR. RODGER: Q. Do you know that
20 information?

21 MR. MacLELLAN: A. Not specifically. I
22 know that a number of municipal PUCs rent hot water or
23 electric water heaters, as does Ontario Hydro in the
24 rural areas. It is done essentially as a customer
25 convenience, to avoid people having to find a plumber,

1 go to Canadian Tire and by a water heater. The gas
2 company offers rental water heaters across the province
3 as well. But why they picked this specific example, I
4 don't know.

5 Q. One of the points above that is local
6 offices lack autonomy.

7 Now this is a 1988 study, to be fair.
8 Has the structure within Hydro changed that might give
9 local offices more autonomy, might help to implement
10 other demand management programs?

11 A. Yes. As has been explained before by
12 this panel, we had a fairly major restructuring over
13 the last year-and-a-half to two years, where we went
14 from about six local offices to 15 local offices, so
15 that these offices could be located right close to
16 their major customers, they could develop a much better
17 rapport with those customers and the service provided
18 could be much better.

19 Q. And was the problem before that these
20 satellite offices, they didn't have the authority to
21 perhaps implement certain plans, or what was the
22 problem? Was it a reporting problem? They had to
23 report to the main office? I guess I don't understand
24 the lack of autonomy, how that characterized itself.

25 A. I'm trying to see what that would

1 focus on. A program like R2000 by its nature is fairly
2 centralized in terms of delivery. What we try to do is
3 get local offices to work with local builders to
4 implement the R2000 program, and to make it work and
5 build in a specific area.

6 I guess what was lacking and what has
7 changed are some program elements that those local
8 offices could use with the builders. Things like co-op
9 advertising, things like specific promotion of R2000
10 developments in non-gas areas, things like that that
11 are now available for the local offices to use.

12 In 1988, it was quite an early period
13 both in our demand management efforts, and it was a
14 tough time for R2000, because the federal government
15 was dropping it and we were attempting to pick it up,
16 and there was a transition period there.

17 Q. And the R2000 program, it was
18 originated with the federal government, wasn't it?

19 A. Yes, it was.

20 Q. Okay.

21 On page 23, I want to ask you whether
22 these findings are still indicative of the situation
23 today.

24 It reads:

25 "Energy efficiency construction

1 practices in heating systems as new home
2 options do not have significant buyer
3 acceptance versus other possible options.
4 Builder experience indicates
5 approximately 5 to 10 per cent of new
6 home buyers will choose an energy option.
7 Energy oriented options compete directly
8 against other possible options for the
9 buyer's dollar. Builders feel that the
10 buyer is most likely to choose options
11 which are visible and will offer a return
12 when the home is sold. Tract builders
13 who are primarily concerned about
14 production offer little or no options
15 above code. Majority of energy upgrade
16 options adhere to the NRC measures
17 introduced in 1983. Finally, builders
18 will only incorporate energy efficiency
19 construction practices as a standard
20 item, if the government changes the OBC
21 or consumer demand increases so that the
22 builder can maintain his expected
23 margin."
24 Although this survey was 1988, does that
25 reflect reality today in your experience?

1 A. As a general statement for the
2 construction industry, yes. The exception actually is
3 with our R2000 trained builders.

4 Q. I'm sorry, the which?

5 A. The builders who are trained in R2000
6 construction techniques. Not only because they are
7 more interested in energy efficiency, but they are also
8 given some seminars as to how to market and promote the
9 more efficient housing construction methods.

10 But in general new home buyers are still
11 a little more concerned about marble tiles than the
12 energy system. That's what we are working to change.

13 Now awareness of R2000 based on customer
14 research is very high. As a number of pieces of
15 research in the Registry of Customer Research show, it
16 has a very high recognition level, both the name and
17 also most people can name at least one benefit of an
18 R2000 home. So that's the base level of awareness that
19 we are working with to then convert this awareness into
20 purchase behaviour.

21 Q. So, it goes back to again what we
22 were talking about yesterday of changing a behaviour.
23 Changing consumer spending patterns.

24 A. Yes. And that survey actually was
25 another reason why one of the areas we concentrated on

1 was working with the provincial government on the
2 Ontario Building Code. We were very much a part of
3 suggesting revisions and reviewing suggested revisions
4 to the code change that happened late last year.

5 Q. Could you tell me a bit about how
6 builders get to be trained for the R2000 program? Who
7 implements these seminars and who organizes the
8 training and so forth?

9 A. It is a two stage effort. The first
10 one is a short seminar, where we try to interest as
11 many builders as possible in R2000 construction. That
12 seminar is conducted by Ontario Hydro.

13 Then once they are interested and want to
14 take the training, the training is conducted by the
15 Ontario Home Builders Association. Ontario Hydro has
16 reached an agreement with them for the continuance of
17 the R2000 concept, and the Ontario Home Builders
18 Association handles all the training and the
19 certification of the builders as R2000 builders.

20 Q. How many builders has Hydro given
21 these seminars to?

22 A. The seminars or the training?

23 Q. The seminars and the training,
24 approximately.

25 A. Over a thousand.

1 Q. And over what time period?

2 A. About two years.

3 Q. Roughly how many builders are there
4 in the province?

5 A. I don't know that number offhand, but
6 I could certainly find it fairly quickly after the
7 break.

8 Q. I'd appreciate that.

9 THE CHAIRMAN: You have given the seminar
10 to over a thousand, or you have trained over a
11 thousand?

12 MR. MacLELLAN: Over a thousand have
13 attended the seminars. I don't know offhand the number
14 trained.

15 MR. RODGER: Q. I wonder if you could
16 turn to page 29 of the survey, please.

17 THE CHAIRMAN: Of course there is a
18 terrific variety in size the builders. Big
19 constructors and small constructors.

20 MR. MacLELLAN: Actually the large
21 contract, the large builders don't tend to get involved
22 in the R2000 program. It tends to be more of a small
23 to medium custom and semi-custom type of business. We
24 haven't yet made the inroads into the large companies.

25 MR. RODGER: Q. And is this because of

1 the concern with the tract building?

2 A. Yes.

3 Q. If you could turn to page 29, please,
4 of this survey. And it points out that:

5 "Builders have limited knowledge of
6 ground source heat pumps and are
7 concerned about utilizing an unfamiliar
8 technology."

9 And then two points down it says:

10 "Greenpark townhome experience has
11 created builder concern."

12 Is there anybody on the panel that is
13 familiar with that Greenpark townhome experience?

14 A. I know a bit about it; not much
15 detail.

16 Q. Could you give me an overview,
17 please?

18 A. There was a subdivision north of
19 Toronto where a couple of hundred houses were
20 constructed using ground source heat pumps, and there
21 were two problems that occurred. The first was that
22 the ground source heat pump installer apparently didn't
23 put a heavy enough gauge pipe in the ground loop. And
24 the second was a fairly unique ground soil condition
25 that caused the freezing in certain sections to pinch

1 off the pipe. I believe they call it ice lensing. And
2 the two combined to make the ground loop portion of the
3 ground source heat pump inoperable.

4 Since then that ground source heat pump
5 contractor has gone out of business, and that problem
6 hasn't reoccurred anywhere else. That's a fairly old
7 concern. We don't hear it very often any more.

8 Q. So at the time, in '88, when this
9 survey was being conducted, perhaps it is an example of
10 what Ms. Fraser said about once burnt, twice shy. If
11 there is a problem with a new technology, it may take a
12 little time to get over that.

13 A. It seems that that has been gotten
14 over already.

15 Q. On page 30 of this study, the third
16 point, the survey found that:

17 "Ground source heat pump installation
18 would only occur if 100 per cent of the
19 additional capital cost was supplemented
20 by an incentive program, plus a payback
21 was evident on the costs supplemented by
22 the incentive."

23 Given this finding, did Hydro ever
24 consider increasing the amount of incentive right off
25 the start, right when it introduced the program with

1 respect to the Demand/Supply Plan? You have talked
2 about increases with the R2000 home generally, but
3 given this finding in '88, was it apparent to Hydro
4 that perhaps it would take a large incentive like this
5 to make the realization of ground source heat pumps a
6 reality?

7 A. No, and that's because the question
8 had to do with ground source heat pumps in gas areas.
9 I see the statement at the top. The economics are far
10 different where gas isn't available. But this comment
11 was specifically related to installation of ground
12 source heat pumps in gas areas. And since the decision
13 was not to offer the incentive in a gas area, then that
14 wasn't a concern.

15 Q. Okay.

16 I wonder if you could go right to the
17 page 41, the final reference from this document I want
18 to make. That is the recommendations.

19 The first is:

20 "An incentive program for R2000
21 construction could be offered in electric
22 only regions."

23 And from what you said today, I
24 understand that you have implemented this
25 recommendation.

1 A. That's correct.

2 Q. "The value of the incentive should be
3 based on the capital cost differential."

4 How about that recommendation, was
5 that --

6 A. The value of the incentive is based
7 on three things really. The capital cost differential,
8 the payback and the avoided cost to Ontario Hydro, plus
9 the somewhat less quantifiable, which is how much will
10 it take to move the market, and that is the qualifier
11 we always add when we are trying to decide on
12 incentives.

13 Q. I take it that is still uncertain.

14 A. How much is required to move the
15 market? That's always a matter of judgment.

16 Q. Okay. The next recommendation is
17 that:

18 "Ontario Hydro could consider
19 establishing an R2000 service program in
20 its regional offices."

21 Did Hydro adopt that recommendation?

22 A. No, we have instead coordinated it
23 with the Ontario Home Builders Association. They have
24 regional offices, and they coordinate builder training
25 and testing. Because each R2000 home requires an air

1 test before an incentive will be paid, which means you
2 put a blower door on the front door, and you see what
3 the air change rate is, and the Home Builders
4 Association coordinates that instead of our own
5 offices.

6 Q. So that, in fact, is being done.

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25 ...

1 [10:55 a.m.] A. It's being done by the Builders
2 Association, yes.

3 Q. And information programs aimed at
4 builders and homeowners regarding R2000 construction
5 and ground source heat pumps?

6 A. We are doing that as well through
7 seminars and information programs for the builders and
8 through advertising campaigns and literature
9 distribution to customers.

10 Q. Okay. Thank you.

11 I would like to now have a look at the
12 commercial sector.

13 Now, Mr. Burke, you have said on a number
14 of occasions that Hydro assumes that all commercial
15 buildings have access to natural gas for the purposes
16 of the demand management plan. Yet, I also see that
17 there are a number of programs in the plan with respect
18 to the commercial sector that are only available for
19 all-electric apartment buildings. I wonder if you
20 could turn to page 16 of Exhibit 304, which is an
21 excerpt from Exhibit 25, halfway down the page is
22 energy-efficient technology packages for apartments.

23 MS. FRASER: A. Excuse me, Mr. Rodger,
24 these aren't program descriptions; these are technology
25 descriptions.

1 Q. Okay. Technology descriptions, all
2 right.

3 Actually, first before I start, Mr.
4 Burke, could you tell me what the percentage of total
5 stock, in terms of apartments, is all electric?

6 MR. BURKE: A. I believe in apartment
7 sector, 35 per cent.

8 Q. 35 per cent.

9 A. I could check that, but I think it is
10 about 35 per cent.

11 Incrementally in new units it's much more
12 than that, it's 45 or 50 per cent. I think the sector
13 average is about 35 per cent.

14 Q. Now, on this page 16, under new
15 all-electric apartments and existing all-electric
16 apartments, there are some technologies that are
17 pointed out; for example, under the new all-electric
18 apartments there is triple glazed windows, heat
19 exchangers for ventilation, and so forth, that don't
20 appear under new apartments. I am just wondering, does
21 the incentives for that kind of new technology --

22 A. Excuse me, that do appear under new
23 but don't under existing?

24 Q. That's correct.

25 A. It's the opposite of what you said.

1 Q. I'm sorry.

2 These technologies for the all-electric
3 apartments, is this there not a risk that they will
4 encourage more builders to build only all-electric
5 apartments?

6 A. I think before Ms. Fraser comments on
7 what actually is happening in programs, I should
8 explain the context for this table.

9 It's from Exhibit 25 and it is the
10 analysis by building type of the package of economic
11 efficiency improvement measures that has been
12 identified for the building type, and we have a long
13 list of candidate technologies that are applied to each
14 and every building type and we test the economics of
15 each in the context of that building type and in the
16 context of the typical building profile that is
17 described in the background documents to Exhibit 25.

18 What you are looking at here are the
19 technologies that are economic according to the total
20 customer cost test for that building type.

21 The issue of fuel choice in an apartment
22 building is dominated in large part today by the issue
23 not of price of fuel or anything like that, but of the
24 controllability of the fuel source by the occupant of
25 the particular apartment unit. Essentially, the

1 choices between central systems probably where there
2 are rental units, and individual heating systems for
3 each of the units where typically the occupant owns the
4 unit or it is individually metered.

5 So, at this point we have not
6 particularly considered the use and it is certainly not
7 at all -- I think there is almost no instance of it in
8 Canada of individually metered, individual apartment
9 units with gas heating. There is a constraint, safety
10 concerns, whatever, about having a gas pipe through a
11 multi-residential building.

12 So, the risk that you are talking about
13 in general, before Ms. Fraser even discusses the
14 problem, it doesn't really arise in practice unless we
15 move to an environment where, in fact, we start, and
16 this would very much be a start, having baseboard or
17 individual unit gas heating systems. It's not the
18 practice at all, it's not a function of the price
19 probably, but of much other concerns about the use of
20 gas in that application.

21 So, what we are attempting to do is where
22 we see the electricity is used, we want it to be used
23 as efficiently as possible and we have listed all the
24 economic measures here. How much are taken up in
25 programs and are feasible, that's something that the

1 program design people concern themselves with.

2 Q. Maybe I mistook the direct evidence,
3 but I thought in fact that that idea of the individual
4 metering for apartments, that was in fact contemplated
5 under the new changes in the legislation, that that
6 might be an example of a new building code.

7 A. Individual metering in apartment
8 buildings probably would have the effect of increasing
9 the efficiency with which electricity space heating
10 units are used, but there are other barriers to be
11 overcome before we have individual apartment units
12 heated by gas, sort of separate combustion units within
13 each apartment building.

14 MS. FRASER: A. I would point out that
15 the most likely places where electricity was being used
16 for space heating in knew multi-residential buildings
17 was in non-profit housing, because of the problem I
18 discussed earlier in terms of the government
19 regulations with respect to the maximum unit price for
20 each of those things. Because of that barrier, and
21 because we raised the issue with the Ministry of
22 Housing, the Ontario government announced in March that
23 there was a ban on the use of electricity for
24 non-profit housing in the Province of Ontario where gas
25 was available, with the exception of heat pumps when

1 cooling was required for senior citizens' buildings or
2 something.

3 So, that issue of fuel switching is
4 virtually non-existent in this market, that and the
5 fact that no one is building apartments in major
6 metropolitan areas.

7 Q. Actually I am going to come back to
8 that later on. Thank you.

9 Now, am I correct when I say that for the
10 purposes of Hydro's demand management plan, that
11 technologies that are marginally negative, they have
12 not been included as being economic because of
13 uncertainties; is that right?

14 MR. BURKE: A. In the plan in practice
15 no technologies that have negative -- do not pass the
16 total customer cost test were included in the estimate
17 of total potential.

18 There is a paragraph which you indicated
19 from Exhibit 25, and I have done this to underlie your
20 question, I'm not sure, but in practice the end result
21 is that no technologies that did not pass total
22 customer cost test were included, either in Exhibit 25
23 or Exhibit 76.

24 Q. Is it because of the uncertainties,
25 is that the reason why they are not incorporated?

1 A. Well, I am not sure about the role of
2 uncertainty in all of this.

3 We have essentially given our best
4 estimate in each case. Rather than draw a fuzzy line
5 around the results, we have accepted the results that
6 come out of the total customer cost test given the
7 individual point values we have put in. In practice,
8 the uncertainty would go both ways.

9 The risk that you would be including
10 technologies that maybe end up costing more and
11 excluding some that may end up costing less and so on,
12 we have assumed that that averages out and that we are
13 making a reasonable estimate of the potential.

14 When it comes down to individual program
15 application, people can look at these things in more
16 detail and rule on whether it's expedient or not to
17 exclude particular marginally uneconomic technologies,
18 and whether that makes a significant impact on the
19 benefits to Hydro either way. There could be
20 circumstances, as Ms. Fraser, as indicated where it's
21 advantageous to just include some of this marginally
22 uneconomic measures in order to get the whole thing
23 done. But as we have indicated several times, we are
24 not particularly seeking out uneconomic measures.

25 Q. Actually, Mr. Burke, you have

1 entirely anticipated my questions because I was going
2 to ask you if you would agree with me that there is
3 even a stronger reason not to include measures which
4 are marginally positive. Because, to give you an
5 example, don't you run the risk that, first of all, if
6 the technology proves to be more capitally insensitive
7 than it was, and we have the example of Ms. Fraser of
8 the hotel room sensors that were three-fold, the
9 incentives were increased three-fold, and also if you
10 put in those marginally positive technologies and you
11 find out that they don't achieve the demand management
12 savings that you anticipate, the demand has to be made
13 up somewhere.

14 A. Well, my sense of that is to look at
15 the load reduction curves in Exhibit 76 and to see that
16 the number of technologies that are close to the margin
17 in especially the commercial sector are very few, and
18 most technologies have a significant cost benefit
19 advantage right now.

20 That there are risks going both ways,
21 that as new technologies are introduced and the volume
22 of their takeup in the marketplace increases -- and I
23 think particularly of T8 lamp systems, the cost of
24 those units are invariably, in my view, going to go
25 down.

1 MS. FRASER: A. They are already
2 starting to come down.

3 MR. BURKE: A. So, there are risks in
4 all directions and we have taken the approach not to
5 try to anticipate the outcome of these risks but to use
6 the best information we have today. When we do this
7 analysis again some years from now, or each year, but
8 over time when we are look being back at it, probably
9 the values that we use in specific instances may
10 change, but the anticipation is that there will be some
11 things that get more economic, some that get less
12 economic, and that we will have made a good estimate
13 today, and we will make a good estimate again at some
14 point in the future with, again, the best information
15 available at that point in time.

16 The expectation is that the way we have
17 done it is the best way of forecasting the ultimate
18 impact, and we don't want to get into the speculation
19 game of how these technologies costs will evolve. The
20 reason we are using commercially-tested technologies is
21 that we feel we have a pretty good sense of the amount
22 of energy they will save in practice, so that there is
23 less speculation perhaps on that side.

24 Although, clearly, until we have a lot of
25 field experience with their use, we won't be able to

1 prove that.

2 Q. If you could now turn to page 19 of
3 Exhibit 304. This is from Exhibit 76, Table 3.3.21,
4 and it describes various commercial sector
5 technologies. You see an asterisk beside four
6 technologies, and you state that these are new
7 technologies and that they were not considered in the
8 1989 Demand/Supply Plan.

9 First of all, could you tell me why they
10 weren't included in the plan? Are they just too new?

11 A. Actually, I believe this has come up
12 before either in direct evidence or previously with
13 other intervenors. But going through it again, the
14 electronic ballast, the issue there was that there were
15 concerns about side effects of the operation of the
16 electronic ballast in '88 and the product quality has
17 improved now, certain manufacturers are warranting
18 against the problems associated with harmonics that
19 were prevalent in '88. And so we now feel comfortable
20 in certain situations with including electronic
21 ballasts as a technology that is reliable and
22 acceptable and proven.

23 So, we knew about it before but there
24 were problems with it and we were waiting to see that
25 the problems were corrected.

1 Q. And those problems were more of a
2 technical nature than a cost --

3 A. Yes. Yes, that's correct.

4 The ground source heat pump and the high
5 performance windows were both technologies related to
6 space heating. And my rationale is simply that when we
7 did the study in '88, the role of electric space
8 heating in commercial buildings was considered to be
9 relatively small on average across the sector, and the
10 largest, by far, sector with electric space heating is
11 the multi-residential apartments.

12 But what has happened since in '88, '89,
13 and right into 1990, was a significant increase in the
14 market share of electricity in the new construction
15 market in the office sector, and on the basis of that
16 we felt obliged to take space heating conservation
17 measures more seriously for the commercial sector than
18 we had in 1988.

19 So, in a sense, we felt we were not
20 leaving out too much in 1988 by not explicitly treating
21 any technologies that reduce space heating load, now we
22 are taking it much more seriously and we included these
23 measures.

24 Efficient cooling, I think what we have
25 now is winter free cooling in the office sector, and

1 that's, I think, just an increase in the sophistication
2 of our analysis to recognize that there is cooling
3 going on in large office buildings in winter. And so
4 from the perspective of winter peak savings, there is a
5 benefit to improving the efficiency of that cooling
6 operation.

7 Q. That efficient cooling, does that
8 also have a technical concern aspect to it, or is that
9 technology known?

10 MS. FRASER: A. No, it's purely, I
11 think, gathering more market information with respect
12 to the incidence of a net cooling load in large office
13 buildings and the potential for large retail buildings
14 to be net cooling.

15 Q. Okay. Thank you.

16 Mr. Burke, to come back to you again. If
17 you could turn to page 20, please. It's from Exhibit
18 76, Table 3.3.22. I suppose this ties into our earlier
19 discussion about technologies that are on the margin in
20 terms of economics.

21 If you look down to the ground source
22 heat pump for commercial, you see a customer payback of
23 14.4 years, and if you go over to the second last
24 column, total customer savings, you see its .8 cents
25 per kilowatthour.

Given what we have talked about in terms of how decision-makers make decisions, given the concerns about payback periods, and in this case it's fourteen years, and given that it was a very, very small customer savings, how confident are you that a technology like this in the commercial sector will be implemented?

MR. BURKE: A. Well, first of all, this list only addresses the potential economics of that technology.

• • •

1 [11:16 a.m.] It probably would not very often be
2 implemented by the customer, given the parameters here.
3 And that's why a program would be required in order to
4 induce the measure.

5 Now, what is given here is the avoided
6 cost. I think we have already discussed that we have
7 decided to accept our point values, and given that this
8 is an economic measure, not concern ourselves with the
9 risks that we essentially have a reasonable estimate of
10 costs and energy savings for this technology, and if
11 its economic, we will pursue it further.

12 THE CHAIRMAN: But there is not much room
13 for a program, is there?

14 MR. BURKE: Well, I think there are
15 program costs taken into account in the way the
16 lifecycle cost, including administration, as it says at
17 the top of the column, is calculated. So that --

18 THE CHAIRMAN: That would include program
19 costs and incentives?

20 MR. BURKE: Yes, it includes a generic
21 estimate of that. What I'm not sure about is whether
22 it is a 20 or 25 per cent premium or whether it's \$350
23 a kilowatt. That's what I have to check at break. But
24 it is one or the other.

25 MS. FRASER: What we are also doing,

1 particularly where gas is available, is advising people
2 to put a gas boiler on the loop, and that improves
3 their operating costs considerably.

4 MR. RODGER: Q. I'm a bit unclear now.
5 I thought for the lifecycle costs that program costs
6 were not included.

7 MR. BURKE: A. Well, I said generic
8 estimates of program costs are included. I wasn't sure
9 exactly how much, and I'd have to check at the break.

10 I guess what I was suggesting before,
11 just to be clear about this, is that in subsequently
12 delivering a program, and the energy management branch
13 program people are getting down to the brass tacks.
14 They may come up for a specific program with slightly
15 different estimates of what those program delivery
16 charges are. What is included here is a flat amount on
17 all programs, and as I say, I'm not sure whether it is
18 a percentage or a dollar amount. I think we have used
19 both approaches at different times. I have to be clear
20 for Exhibit 76.

21 Q. That's fine.

22 I will turn to a new area within the
23 commercial sector. Would you agree with me that the
24 timing of energy savings varies according to the type
25 of use that you are looking at? And for example --

1 A. Time of day you mean, for instance?

2 Q. Yes, for example, savings of
3 electricity in the office sector. Office equipment
4 would be mainly in the peak periods, and lighting and
5 heating would be less so, since those are things that
6 have to be done throughout the day.

7 A. Well, there is quite a range of
8 operating characteristics of buildings that are built
9 into our analysis.

10 MS. FRASER: A. I'd just like to point
11 out our peak is from 7:00 in the morning till 11:00 at
12 night. So all office lighting is on during that time,
13 and their heating and cooling systems are operating
14 during that time, as well as their office equipment.

15 Q. But certainly the avoided costs for
16 each particular use, that will depend on whether they
17 are peak or off-peak?

18 MR. BURKE: A. Yes. I think if you look
19 at the tables in the back of Exhibit 76, you can see
20 the same technology applied in the different building
21 types, and the avoided costs given for the same
22 technology will differ because of the hours of use of
23 the building, and that will take in to account when
24 those hours are. That is, whether they are in peak
25 periods or off-peak, summer, winter and so on.

1 So that in calculating avoided costs, we
2 are being as careful as we can to reflect the actual
3 costs imposed on the system.

4 Well, actually, strictly speaking what is
5 in the tables is the benefit to us of reducing those
6 loads. It is the avoided cost of the saved energy, but
7 that typically is pretty similar to the underlying
8 profile of the end use itself.

9 Q. Perhaps you could clarify a point for
10 me, Mr. Burke. If you turn to page 21, again at
11 Exhibit 304, and this is from page C9 of Exhibit 25,
12 and you see that there is a description, there is
13 Divisions of Energy Savings, and under the office there
14 is the percentage of 80 per cent for the peak period.

15 Now, are you assuming there that 80 per
16 cent of savings is for all technologies across the
17 office sector, or do you look at individual
18 technologies and see what the percentages that are used
19 in the peak time and the off-peak time?

20 A. As a matter of fact, it is done on a
21 technology basis. So that we would probably have
22 different views about lighting and HVAC systems.

23 Q. So you are not assuming 80 per cent
24 across the board.

25 A. No.

1 Q. Okay.

2 A. That just, I think, is indicative
3 of -- well, yes, I think it is just a general
4 indicator. But in practice it is done technology by
5 technology, and I believe that sort of breakout is
6 available in the EIL study that is a background
7 document to Exhibit 25 that was filed in response to
8 Interrogatory 4.7.4.

9 Q. Now, I understand that the office
10 segment accounts for the largest single component of
11 commercial sector savings for potential induced EEI.
12 Is that correct, Mr. Burke?

13 A. Yes.

14 Q. If you go to page 28 of Exhibit 304,
15 which is from Exhibit 76, Appendix B3, for the office
16 segment you see second last column, from 1990 to the
17 year 2000, the average penetration rate, and you have
18 the number of 40 per cent right across the office
19 sector.

20 Now, we have given a few examples this
21 morning and yesterday about various payback periods.
22 Lighting I think we talked about was 1.7 years to four
23 years, the heat pump is up as high as fourteen years.
24 I'm wondering how you came up with that 40 per cent
25 figure across the board, given the different payback

1 periods for the office sector.

2 A. The spread sheet prints out a value
3 for penetration rates for each of the technologies, for
4 each of the building types. But for the ones -- and
5 there are a few where that is not the case, but for the
6 ones where they are all the same, effectively the
7 penetration rate is on the package of measures that is
8 identified as potentially available. So, the focus
9 really should be on the circled 40. Under "Total,"
10 that is what we have estimated the penetration rate of.

11 What the analysis does is look at a
12 typical building and typical economic or the typical
13 maximum economic efficiency improvement for that
14 building type, taking into account the synergisms
15 between the various technologies and systems in the
16 building. And the penetration rate is on the package.

17 Q. I see.

18 A. Now again, this is analysis done
19 independent of the way the programs might ultimately be
20 designed. They may be designed to deliver packages,
21 they may be designed to deliver individual
22 technologies. People will determine over time the best
23 way to maximize the penetration rate. But for the
24 purpose of this analysis, it is a single average
25 figure.

1 Q. I see. So when it is shown here that
2 the ground source heat pump has a 40 per cent
3 penetration rate, that doesn't mean that you actually
4 expect that technology to have that percentage
5 penetration rate. It is the way --

6 A. Yes, I think it is unfortunate that
7 all these numbers are printed out explicitly. What we
8 are expecting is that we will get 40 per cent of the
9 potential savings one way or another.

10 Q. Okay. That's helpful, thank you.

11 I'd like to discuss for a few minutes how
12 you go about designing incentives for the commercial
13 sector. And I think this stems back once again to the
14 idea of being able to influence consumers to make
15 decisions.

16 In the first example I want to talk about
17 office building owners.

18 MS. FRASER: A. Well, in the commercial
19 market, one of the issues is it is not the consumers
20 that you are necessarily influencing, it is the
21 consulting engineers, the architects, the developers.
22 The person that actually consumes the energy, such as
23 you and I sitting in this office building consuming the
24 light, we don't have anything to do with it.

25 Q. I think that is exactly right. That

1 is the point I'm trying to get at. It is normal for
2 tenants to pay a net rent and to pay their utilities
3 after that. I'm wondering how you design the incentive
4 so that the owner or the builder is going to have more
5 increased capital cost, and the benefit is going to
6 flow to, as you said, you and I, who are going the
7 benefits of this?

8 A. Well, I don't think the benefits
9 necessarily have to go to you and I. The person that
10 is paying the rental on the space would get the benefit
11 on a triple net lease.

12 Dealing with these issues in a number a
13 ways, in -- stick to offices, we are dealing with new
14 construction, and next year we will be announcing an
15 enhancement to savings by design, but right now savings
16 by design does apply to new construction. Basically,
17 there we will provide \$500 a kilowatt for any demand
18 reducing option, or 10 cents a kilowatthour for energy
19 reducing option over the base case design. And that's
20 paid to the developer of the building. So, that deals
21 with that.

22 In decision-making we are marketing that
23 program through consulting engineers, because we found
24 when we did our research that consulting engineers were
25 more than likely the ones to make the decision about

1 the heating system within the whole realm of the budget
2 for the building. Traditionally what you would get for
3 a heating system in an office building is some
4 perimeter electric space heating, usually a gas boiler.
5 We have now seen a trend to an internal source heat
6 pump, which moves heat from the core of the building to
7 the perimeter of the building, and that provides a lot
8 more efficiency and that uses the internal heat gains
9 from lighting, from people, from office equipment to
10 heat the building, and that has provided great
11 efficiency.

12 So working through the consulting
13 engineering community to get them to accept that
14 technology, and then get them to market that technology
15 to developers has been something that we have been
16 working on for quite some time.

17 We just recently did some research and
18 found that consulting engineers expect that developers
19 don't want to hear about options that are more
20 expensive up front, even if it is going to save them
21 money over the long haul, and the same research found
22 out that developers assume that consulting engineers
23 will bring forward ideas to them that will save them
24 money in the long term, even if it does cost them more
25 up front. So, essentially, what we discovered was a

1 barrier that is a communication gap, and we are working
2 to ameliorate and reduce that communication gap.

3 The new construction enhancement that
4 will be in place next year will be based on this
5 standard, ASHRAE 90.1, and until we can get the
6 provincial government to implement a standard in the
7 building code format, we have no energy-efficiency
8 elements in the building code for commercial buildings
9 at present.

10 We will be paying incentives in order to
11 get people to move up to that energy-efficiency
12 standard, and then paying a more mixed incentive for
13 people to go beyond that.

14 So, we are working through our incentives
15 to do that, and basically we have designed savings by
16 design to do that and to address issues in those
17 markets. The marketing around savings by design, in
18 terms of communications with consulting engineers and
19 developers, a lot of it is one on one contact. Our
20 field staff are in close contact with the major
21 consulting engineering firms, the major developers.
22 And very often some of the major development firms,
23 which are large real estate owners, obviously, we can
24 work back and forth between existing buildings and new
25 buildings with that development company.

1 Q. To date are you able to track how you
2 are doing it, breaking down these barriers? Or is it
3 too early to tell?

4 A. Well, our savings by design program,
5 as I indicated in my direct evidence, has -- by the end
6 of this year we expect to have over a thousand
7 applications representing what was 80 megawatts of
8 savings, which actually exceeds what we have in our
9 program concept reference document for savings by
10 design. And so that, I think, has been quite
11 successful.

12 The lead time which we have to get in to
13 the new construction market is, of course, critical,
14 because we have to get in at the early design stages,
15 because no one likes delays at the last minute to
16 change their designs.

17 For example, the IBM building at Markham
18 and Steeles, which is operating this year, includes a
19 thermal cool storage system, which will be shifting
20 almost 2 megawatts off their peak in the summer, and
21 just over a megawatt, 1.1 megawatts in the winter. We
22 have been working with IBM since 1987 on that building.
23 So those sorts of things are happening, and yes, we are
24 seeing some changes.

25 I think different builders and different

1 consulting engineers operate differently, and we have
2 got early adopters, and then we've got some of those
3 optimistic followers and so on, and we are working
4 through that.

5 MR. RODGER: Would you like to take the
6 morning break, Mr. Chairman?

7 THE CHAIRMAN: Break for 15 minutes.

8 THE REGISTRAR: This hearing will recess
9 for 15 minutes.

10 ---Recess at 11:33 a.m.

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1 ---On resuming at 11:50 a.m.

2 THE REGISTRAR: Please come to order,
3 this hearing is again in session. Be seated, please.

4 THE CHAIRMAN: I would like to read into
5 the record another exhibit. It's filed by Ontario
6 Hydro. It is entitled, "Internal System Values of
7 Power and Energy, Ontario Hydro Systems Planning
8 Division, August 1991."

9 I think for those who are following in
10 the transcript, I might read in what the abstract says
11 about this document. "This exhibit contains Hydro's
12 February 1991 prediction --

13 MR. B. CAMPBELL: Mr. Chairman, I'm sorry
14 to interrupt. My copy of this has two document precis
15 on the front of it, I think if yours does as mine does
16 then you are reading from the top one. I think the
17 applicable one is the next one which reads the same
18 program. "This exhibit contains Ontario Hydro's August
19 1991..."

20 THE CHAIRMAN: I'm sorry.

21 MR. B. CAMPBELL: You don't have any
22 reason to apologize. I think we have a reason to
23 apologize and I am sorry for that. I think if you tear
24 off the top of the document precis and throw it away,
25 we will then be fine.

1 THE CHAIRMAN: You are not allowed to
2 throw it away, you have to recycle it!

3 MR. B. CAMPBELL: I will pick it up
4 later.

5 THE CHAIRMAN: Let me start again.

6 "This exhibit contains Hydro's August
7 1991 prediction of Incremental System
8 Values of Power and Energy. It
9 supersedes the predictions dated February
10 1991 and filed as Exhibit 175. The data
11 in this exhibit incorporates assumptions
12 in the 1991 Business Plan and changes in
13 the load forecast, financial and economic
14 indicators. It does not include recently
15 announced changes in demand management
16 targets.

17 "Two sets of incremental system values
18 are provided, one for planning and a
19 second for project appraisal."

20 Mr. Rodger.

21 ---EXHIBIT NO. 309: Document Precis, "Incremental
22 System Values of Power and Energy,
23 Ontario Hydro Systems Planning Division,
August 1991."

24 MR. RODGER: Thank you, Mr. Chairman.

25 Q. Ms. Fraser, I would like to put one

1 further situation to you with respect to the commercial
2 sector. Again, we are at the topic of how
3 decision-makers decide, and you actually raised this
4 earlier on. This is with respect to apartment
5 buildings. You are no doubt aware that rental
6 properties in Ontario are under very strict rent
7 controls.

8 MS. FRASER: A. Correct.

9 Q. I think you would agree that in this
10 environment landlords have found it very difficult to
11 cover costs and provide a fair rate of return on their
12 investments, and you acknowledge that as one of the
13 results of that, just no one is building apartment
14 buildings right now.

15 A. Correct. And my staff made a
16 presentation to, I believe its the Legislative
17 Committee, concerning the rent review legislation just
18 recently.

19 Q. If you could turn to page 27 of
20 Exhibit 304, this is from Exhibit 76, Table 3.3.24.
21 Under the third segment that is identified as "New
22 Apartments," and if you go over to the column 1990 to
23 2000 average penetration rates, you are looking at 47
24 per cent.

25 A. 41 for new apartments, 47 for

1 existing.

2 Q. Yes. I wonder if you could tell me
3 how you have come to that rather significant amount of
4 penetration given the situation with the rental housing
5 in Ontario?

6 A. Well, in actual fact, most new rental
7 housing that was being built was non-profit housing.
8 Prior to the changes that were made in March of this
9 year in terms of banning the use of electricity for
10 space heating, we had intended to put a program in
11 place that would address that and target the non-profit
12 housing sector to make it as efficient as possible, and
13 that program would have reflected the cost, the cost
14 restraints through the maximum unit price.

15 Obviously, with the banning of the use of
16 electricity for space and water heating, there wouldn't
17 be electric savings obviously. Hopefully we will get
18 to the point where the gas company will be encouraging
19 energy savings as well.

20 So that basically leaves new
21 condominiums then that are being built, and primarily
22 in areas where gas is not available such as Collingwood
23 and things like that, and we are actually having a fair
24 bit of penetration, some with ground source heat pumps
25 in those sorts of establishments.

1 With respect to the existing apartment --
2 in actual fact this should really say existing
3 apartments and condominiums, it's really the multi-res
4 segment. With respect to the existing non-profit
5 housing program which is currently being rolled out
6 with City Home right now and will be province-wide in
7 January, we are paying the full project cost of
8 lighting, retrofits, air leakage control projects, and
9 where there is electric water heating we will be doing
10 a water heater tune up.

11 Again, it would be great to be doing
12 something in conjunction with the gas companies to tune
13 up the gas water heaters as well.

14 Q. Perhaps I could stop there for a
15 moment. When you say on this recent project that Hydro
16 is paying the full project costs--

17 A. That's correct.

18 Q. --is that another situation where you
19 started with one incentive and you had to increase it?

20 A. No. One of the programs that we
21 instituted or developed as a result of the \$240 million
22 which was transferred from the pre-engineering for
23 nuclear facilities to us, and it was one of those
24 situations where the opportunity and the resources came
25 together at pretty well the same time. With the

1 banning of electric space heating, we then realized we
2 no longer had to focus as much on the non-profit new
3 construction market, although we still have to
4 obviously do that in non-gas areas, and so we were able
5 to sort of redirect our focus to the existing.

6 It's not a question of increasing
7 incentives, although they were eligible before for
8 savings by design, but it's really a case that the
9 non-profit housing market, what we are doing there,
10 it's a direct insulation program, we are arranging for
11 the contractors, it's a sort of full turnkey kind of
12 operation that we are going to do. That sort of
13 reflects the fact that a lot of non-profit housing is
14 run by volunteer boards of directors, cooperatives,
15 things like that, that aren't as accustomed to, shall
16 we say, arranging these sorts of things. There are
17 high information costs for them to do the analysis of
18 different lighting systems and things like that. So,
19 we basically go in and sort of give them some choices
20 of fixtures, but here is the more efficient lamp and
21 here we go, and so that's what we are doing there.

22 Q. So in this situation where it's
23 non-profit housing, Hydro could determine right from
24 the start that we require 100 per cent financing by
25 Hydro to make these programs work; is that right?

1 A. Basically, what we found in our
2 existing programs, we had a very high penetration of
3 lighting retrofits in multi-residential buildings that
4 were not non-profit, the landlords and condominium
5 boards and things like that. Particularly because
6 these are hallway lights, they are on 24 hours a day,
7 so the payback with our incentive is quite attractive
8 to them and they get substantial savings.

9 However, for the non-profit sector they
10 were not participating in our lighting program. They
11 were, however, participating very strongly in our
12 showerhead program which was a showerhead exchange
13 program where we provided them, if there was a 200
14 suite building, we provided them with 200 showerheads
15 providing we got 200 back that we then disposed of
16 and/or recycled in the appropriate manner. But they
17 had no capital costs for that; they just had to do the
18 installation, which the super could do.

19 Q. Thank you. If I could turn now to
20 the industrial sector.

21 Mr. Burke, we have talked about this
22 before. I just want to give one example pertaining to
23 the industrial sector. Could you turn to page 33 of
24 Exhibit 304, and this is from Exhibit 76, Table 3.3.32,
25 it concerns the manufacturing industry. This is back

1 to this debate again about marginally positive and
2 marginally negative technologies. If you look halfway
3 down the technology list we see heat pump and we see
4 that the customer payback is from 12.9 to 16.1 years.
5 If you go over to the second last column, total
6 customer savings it's .3 cents kilowatthour to .8 cents
7 a kilowatthour. My question is just another example of
8 what industry is going to adopt this type of technology
9 with a tremendously long payback period and
10 questionable savings in terms of cents per kilowatthour
11 saved.

12 MR. BURKE: A. I think the point is that
13 no industry will, and as it is economic, it is up to us
14 to provide the incentive to make it attractive to them.

15 Q. I guess even with the incentive, with
16 that total customer cost savings, is it still a
17 worthwhile project given those savings in terms of
18 total economics?

19 A. Well, all this is telling you is what
20 the result of the total customer cost test is.

21 How it actually work out in the
22 customer's cash flow isn't particularly here. I'm not
23 sure what the incentive would be in practice in this
24 application, so I really can't tell you how the
25 customer is going to react to it potentially --

1 Q. Perhaps Ms. Fraser could help us with
2 that.

3 MS. FRASER: A. Our accelerated payback
4 program which would include heat pumps and appropriate,
5 they would basically buy the payback down to a
6 year-and-a-half. I am just trying to look to see if we
7 have any heat pump projects under savings by design.

8 Q. I take it then to buy back that much,
9 that must be almost all of the capital cost of a
10 project?

11 A. There are limits in terms of how it
12 works. But yes, I think if the savings weren't there,
13 then probably the application wouldn't be pursued. It
14 might be pursued as part of a larger package of energy
15 saving activities.

16 Q. Staying with this page 33, I see at
17 the bottom there are footnotes, and you are considering
18 some of these technologies as natural in some
19 industries. I wonder if you could explain that, why
20 are they natural for those industries indicated?

21 MR. BURKE: A. A lot of the economics of
22 application of the technologies in the industrial
23 sector depend on the capacity factor with which they
24 are used.

25 When we are looking at buildings, these

1 things are much more uniform. Although even within
2 commercial buildings, as you were asking me earlier,
3 hours of use is an important factor. But in the
4 industrial sector, the hours of use vary widely by
5 industry and application, and so the economics of the
6 measure vary widely.

7 In my direct evidence I talked about this
8 issue as it pertains to efficient motors, and explained
9 there that there are some applications where with very
10 high load factors, companies would naturally adopt high
11 efficient motors, and there are some applications with
12 extremely low load factors that probably wouldn't pass
13 the total customer cost test, and there is a range in
14 between which the customer wouldn't adopt naturally,
15 but we would find economic, and so we have focused on
16 that portion of the marketplace in estimating
17 potential.

18 I might add that the heat pumps that you
19 were just talking about contribute about 10 megawatts
20 to the total. It's not a major element, big risk that
21 we are taking here.

22 Q. On page 36 of Exhibit 304, this is
23 from Exhibit 76, Table 3.3.34, potential and attainable
24 induced EEI by technology in the industrial sector, you
25 list a series of average penetration rates across

1 various technologies, and I figured out an average of
2 roughly 45 per cent across industry in general.

3 Could you describe for me the basis that
4 you arrived at this percentage penetration?

5 A. The penetration rate assumptions are
6 derived by a group of people in the energy management
7 branch, and I think with some participation by people
8 in the economics and forecast division. All I can say
9 is that given the limited experience, it was their
10 judgment that these were reasonable estimates, and
11 that, as I understand it, the results to date suggest
12 that we may, if anything, in this sector, be
13 understating the attainable. Maybe Ms. Fraser could
14 add some more light to this.

15 MS. FRASER: A. The penetration rates
16 are really based on sort of a bottom up look, segment
17 by segment, region by region and in some cases industry
18 by industry. Company by company in some of the large
19 cases.

20 The segment staff who were responsible
21 for developing the programs and estimating the
22 penetration rates have a very detailed look. As I
23 indicated, there are some 200 customers in industrial
24 account for about 23 per cent of the total provincial
25 energy use. So, we have developed a fair bit of

1 information with respect to these customers through our
2 working relationships on a one-to-one basis at the
3 field level, and that sort of information is gathered
4 by the staff that do the segment by segment analysis.
5 They work really from a bottom up to determine what can
6 be achieved, and that then is used to determine the
7 penetration rates relative to what the economic
8 potential is, which is the numbers in the first column.

9 Q. Perhaps you could tell me, staying
10 with this exhibit, before the total of all the
11 potential induced EEI savings, there is a category
12 other technologies and processes that account for 380
13 megawatts. Would you describe that as a forecast or a
14 target?

15 MR. BURKE: A. It's an estimate of
16 potential induced in the industrial sector that we may
17 not have identified yet specifically in the studies
18 that we have done to date.

19 I think I have to characterize it as
20 again a judgmental estimate based on knowledge of
21 specific applications that were not included in the six
22 major studies of the manufacturing sector and the
23 mining sector that underlay the analysis of the
24 industrial sector potential in Exhibit 76 and
25 previously in Exhibit 25.

1 MS. FRASER: A. A lot of that

2 information also comes from the segment analysis that's
3 done by the field staff and it is translated in to the
4 head office segment analysts. And of that 380 there is
5 about close to 360 that is dealing with turbo
6 expanders, improved motor generator sets and improved
7 delivery and maintenance in various systems, and those
8 things are very, very site specific and they are not
9 the sort of thing that could glean from an overall
10 technology study. It is very important, I think, in
11 the industrial sector as we have noted many times, to
12 be able to marry up that real world experience with the
13 consultant studies and the overall potential estimates
14 done more on an aggregated basis.

15 Q. So, it is a culmination of seeing
16 what is happening in industry and then using your
17 judgment to come up with a number?

18 A. That's right. Very many processes in
19 that are very site specific, and it takes a detailed
20 understanding. In some cases our field staff have been
21 working three, four, five, six years with particular
22 customers. We sometimes wonder if our field staff up
23 in Sudbury works for Inco or works for us.

24
25 ...

1 [12:13 p.m.] Q. And this category, other technologies
2 and processes, it accounts for almost 40 per cent of
3 the entire potential by the year 2000; is that right?

4 MR. BURKE: A. Yes.

5 MS. FRASER: A. A little bit more than
6 40.

7 Q. Okay.

8 THE CHAIRMAN: Just to follow-up on that,
9 just a minute, it is a significant amount in this, and
10 I just -- perhaps you could refresh my memory about
11 this. In the DSP you had a category called
12 Unidentified EEI, and that's no longer a part of
13 Exhibit 76. And then you said, I thought, that, "Well,
14 we look at all these things in existence now and ten
15 years out some will be viable and some won't, but they
16 will be replaced by others. So we don't need the
17 unidentified EEI any more." But what's the difference
18 between other technologies and processes, and
19 unidentified EEI.

20 MR. BURKE: The unidentified EEI in
21 Exhibit 25 was essentially -- the potential was
22 essentially a recognition that there were areas that we
23 had not studied fully, and in order to meet the target
24 of 2000 megawatts, we had to impute that we would get a
25 certain proportion of some unidentified potential. We

1 could account for about 1700 megawatts of the target
2 value in 1988.

3 To get the 2000 megawatts, we had to
4 essentially assume that there would be new technologies
5 that would make -- or not necessarily new technologies,
6 but potential that we had not yet analyzed that would
7 enable us to meet the target.

8 That unidentified was not sector
9 specific, it was essentially a broad amount that
10 applied to electricity use in Ontario in general. I
11 think the distinction in Exhibit 76 is that we are
12 fairly confident, much more confident about the
13 residential and commercial sector and where the
14 opportunities exist, and that we have a fair handle on
15 the potentials in those sectors, but in the industrial
16 sector we don't. Effectively, I think you are right,
17 there is a portion in the industrial sector which is
18 analogous to the unidentified from Exhibit 25, but
19 effectively the difference is that it is all in the
20 industrial sector. It is not an unknown, totally
21 unlabelled commodity. It has been focused as in the
22 industrial sector pure and simple.

23 We certainly agree that we need to
24 analyze many more of these site specific opportunities
25 to flesh that out and frankly, as we do, we may find

1 that our estimates are, you know, inappropriate, and we
2 will have to revise them. This is an area where more
3 study is required.

4 MS. FRASER: Yes, and since Exhibit 76
5 was prepared, there's been a lot more work gone on both
6 with respect to out power saver audits done in
7 industrial buildings and consultant audits that have
8 been done.

9 To the end of July, for example, the
10 consultant studies program has initiated a total 87
11 studies comprising 57 consultant audits and 30
12 feasibility studies. Together that represents about 90
13 megawatts of savings that we have identified through
14 that process.

15 But with respect to additional things, as
16 I indicated, that turbo expander technology could
17 deliver some 60 megawatts, improved motor generator
18 sets, looks like there is an additional 200 megawatts
19 there, and improved delivery and maintenance in
20 compressed air systems. We figured probably about 100
21 megawatts there.

22 There are 200 megawatts all together in a
23 market research study that we did of compressed air,
24 but some of that would have already been captured in
25 the mining industry numbers in Exhibit 76.

1 So one of the things that we will be
2 doing as we update all the potential and the
3 penetration numbers is building in all of these numbers
4 together.

5 MR. RODGER: Q. If I could ask you a
6 couple of questions regarding how decision-makers
7 decide in the industrial sector, it's been your
8 evidence to date that with respect to industry, the
9 payback period is not the only consideration in
10 determining whether a particular technology contributes
11 to potential induced EEI or natural EEI. And would you
12 agree, Ms. Fraser, that the replacement of equipment is
13 normally due to other considerations in industry, such
14 as the need to match competitive technologies?

15 MS. FRASER: A. That's certainly
16 important, although I would point out that the payback
17 stream is a little bit more singular in industrial than
18 it is in commercial, where you have a lot of split
19 incentive circumstances.

20 Q. Perhaps you could describe that. I'd
21 like you to discuss what Hydro has assumed about the
22 decision-making process in industry, relative to
23 investments that affect electrical consumption. And
24 the first area is the payback period.

25 A. Well, certainly the reason we

1 developed our accelerated payback program is because we
2 recognized that the payback projects with short
3 paybacks were implemented if the customers knew about
4 them. However, longer payback items quite often had to
5 compete with other uses of the firm's capital.

6 So that's basically the reason why we
7 developed the accelerated paybacks, to bring the
8 payback down to pretty well one-and-a-half year level.
9 We used that same approach in our load shifting program
10 to provide incentives for capital investments and load
11 shifting.

12 Now, we do recognize there are a lot of
13 specific issues, technical risk perceived or real is
14 certainly an issue. If a new technology is installed
15 in a plant, and it's projected to save us, you know,
16 let's say, \$100,000 in energy over the year, if for
17 example that production line ends up having to be shut
18 down for some repairs, and the costs incurred can run
19 up pretty quickly, and you could wipe out those energy
20 savings in a matter of days potentially on some
21 production lines. So, obviously, we recognize that
22 that is an issue.

23 And the way in which we are dealing with
24 that is that we are really taking a relationship
25 management approach to particularly our large

1 industrial customers. We recognize energy management
2 is not a one-shot deal with any of them, and that's
3 certainly reflected in the fact that with most,
4 particularly most of our large customers, we don't just
5 have one project but we have a number of projects in
6 various stages and various phases, and that that
7 building from one success to another has, and the more
8 we work together and identify projects.

9 I was sort of facetious when I said
10 before we don't know whether the field staff in Sudbury
11 worked for Inco or worked for us, in fact in our
12 Thunder Bay office we have located one of our energy
13 reps in Great Lakes Paper for a period of months to
14 understand the process, understand how decisions are
15 made, understand where there are opportunities, and we
16 can work together to -- it is very much a partnership
17 in that process, but we do recognize that it's not a
18 straightforward kind of thing.

19 We had one manufacturer who had two
20 plants in one city, and we were on our fourth or fifth
21 project in one plant, and we really couldn't understand
22 why we couldn't get to first base in the other plant.
23 Well, in June it was announced that that other plant
24 was closing. Those things are real and, you know,
25 there is reality out there. We are dealing with that.

1 Q. I, when speaking with Mr. MacLellan
2 earlier on about the three-year payback for the
3 residential sector -- he described it as a rule of
4 thumb and not necessarily a threshold. Would you
5 describe the one-and-a-half-year payback in the
6 industrial sector, that that is a threshold?

7 A. I would also say it is a rule of
8 thumb. The changes, depending on the economic times,
9 with the recession, the word came back very loud and
10 clear from the auto industry they weren't looking at
11 anything that couldn't be financed out of current
12 year's operating budget. So they were looking for less
13 than a one-year payback in the last two to three years.

14 In other cases, there could be other
15 savings or other benefits to the plant, that it is not
16 so much as the payback then that is looked as what
17 those other benefits are.

18 In some cases plants have had to
19 institute cooling in order to conform with Ministry of
20 Labour requirements and agreement requirements. We
21 will work with customers and put the cooling in at the
22 most efficient, which sometimes actually can, you know,
23 overall improve the financial look. It is not
24 something that payback is the issue at all. So it is a
25 whole range of things.

1 Q. What about high capital costs that
2 are associated with new equipment? How does that fit
3 into this picture?

4 A. Well, the capital is the flip side of
5 the payback issue. So that's where our incentives can
6 bring down the capital cost barrier.

7 We also have a business finance plan that
8 will allow -- we can apply our incentive to make
9 basically a zero interest loan with a term of up to
10 seven years, or we can do leases through that process.
11 And some industries have taken and used that process.

12 Q. Now staying with the issue of
13 incentives, I don't understand the timing associated
14 with these incentive programs. With respect to, if
15 industry makes decision on equipment, new equipment,
16 and the reasons for choosing a piece of equipment
17 aren't necessarily how it consumes energy, but other
18 reasons, how do you fit in your incentive to align
19 itself with those various other factors? I might
20 suggest that is even made more complicated, because
21 every industry is different in this regard.

22 A. That's true, and that's why
23 accelerated payback is really a kind of an overall
24 umbrella, and we can look at sort of customized
25 projects within that umbrella.

1 If, for instance, a company is looking at
2 changing a process for competitive reasons, as you
3 indicated, and they are putting an investment in, what
4 we might do then is help them identify the most
5 efficient way to do that, which could be including
6 high-efficiency motors in that package, including
7 variable speed drives, including just high-efficiency
8 pumps and so on, and our incentive could then help
9 offset that incremental capital cost.

10 That would be just associated with the
11 energy saving aspects of it and then, you know, be all
12 rolled into the whole kit 'n' kaboodle, so to speak,
13 using my favourite word.

14 Q. And I take, given the complexity of
15 what has to be analyzed, this is an ongoing process.
16 Like other activities in this area, it is continuing to
17 develop.

18 A. Oh, absolutely, and gaining momentum.

19 Q. If I could talk --

20 A. Although I'm not, but any way --
21 pardon my cold.

22 Q. If I could speak a moment about the
23 financial impact of demand management generally, I take
24 it that the size of the incentives are large, because
25 induced programs are by their nature uneconomic. And

1 you have described --

2 A. Excuse me, could you run that by me
3 again? Everything we do is economic.

4 Q. Well, to the firm that you are
5 targeting.

6 A. The payback falls out of their
7 threshold.

8 Q. Yes.

9 A. Okay.

10 Q. Because if it was economic, they
11 would do it already.

12 A. That's right, it would be natural
13 conservation, and it would be in our basic load
14 forecast.

15 Q. That's why you call it induced
16 measures.

17 A. That's correct.

18 Q. I thought going through this material
19 originally, way back when, that you had natural EEI,
20 and maybe it could have been unnatural EEI, but I
21 suppose induced was a better --

22 A. It used to be call strategic
23 conservation. We have gone through many names.

24 Q. Now along with that, I understand it
25 has also been your evidence that the RIM, the Rate

1 Impact Measure of demand management is negative. That
2 is, at least in the short term Hydro rates are going to
3 increase as a result of demand management.

4 A. Yes, and if you look in the program
5 concept reference document on balance all the programs
6 together have a negative wholesale RIM. They have a
7 positive distributor RIM.

8 Q. Would you agree with me, Ms. Fraser
9 that in these demand management programs, the
10 participants benefit from them, and it's the
11 non-participants who pay for them?

12 A. That's how it works, yes.

13 Q. Now, in Exhibit 76, I don't have this
14 in my package unfortunately, I can just read you the
15 numbers, by 2015, the -- this is page 61, Exhibit 76,
16 Table 3.3.41, "Net Load Impact Forecast of EEI Programs
17 Without Standards."

18 For the year 2015, the cumulative total
19 for the residential sector is 1100, for the commercial
20 sector its 2080, and for the industrial sector it is
21 645.

22 A. Correct.

23 Q. Now I understand that the industrial
24 sector, is it approximately 30 per cent of Hydro's --

25 A. It is about 36 per cent.

1 Q. 36 per cent. And commercial sector
2 is about 40 per cent, and the remainder residential, is
3 that a rough breakdown?

4 MR. BURKE: A. Well, okay, I think we
5 should be clear whether you are talking energy or peak.
6 If you are talking energy, 36 per cent of energy, 37
7 per cent industrial, commercial is just slightly less
8 and about 35 per cent, and residential is just under 30
9 per cent for energy. But the peaks are different,
10 because the capacity factor of the industrial sector is
11 much higher. So it is a much lower proportion of the
12 peak.

13 Q. I think we are talking about peak.

14 A. Peak would be around 30 per cent.

15 Q. 30 per cent, okay.

16 And although the industrial sector, it is
17 not quite a third but almost a third, you are
18 anticipating that industry will yield the least amount
19 of demand management results, that's correct?

20 A. In total, yes. In megawatt terms.
21 Megawatthour terms might be --

22 Q. I am sorry. I understand that this
23 is based on part on the premise that if an option is
24 economic, then industry will put it into place.

25 A. I think your use of the word economic

1 is not specific enough for us to have a good
2 discussion, because the economic from the industrial
3 perspective -- from the customer's perspective, that's
4 true. But when we talk about economic, we are talking
5 about it using the total customer cost test, which is a
6 combination of the customer and the utility industry's
7 perspective. So that we could be talking at cross
8 purposes.

9 Q. Perhaps for this purpose I mean in
10 terms of the customer.

11 A. Could you repeat your question in
12 that context?

13 Q. That Hydro's view with respect to the
14 industrial sector, is that if a demand management
15 option is economic from that customer's point of view,
16 then that industry would have already implemented it.

17 A. Well, by definition, that is part of
18 the natural evolution, but that doesn't bear on this
19 issue of potential induced or attainable induced.

20 Q. Okay. But in terms of the demand
21 management programs generally, I understand that Ms.
22 Fraser said that to date the industrial sector has been
23 tracking ahead of the other two sectors, in terms of
24 actual results.

25 MS. FRASER: A. I am sorry, I missed

1 that question. Would you restate it?

2 Q. I believe it was your testimony that
3 to date, I'm talking with respect to demand management,
4 what has been achieved, that the industrial sector is
5 tracking ahead of the other two sectors.

6 A. That's correct, in terms of the --
7 what we call the gross megawatt results.

8 What I would indicate there is that what
9 we found in a lot of cases, when we go in and do an
10 analysis, that there is a lot of natural conservation
11 that hasn't occurred with a less than
12 one-and-a-half-year payback. And although we do the
13 analysis, and we go through our audits and that and
14 identify it, and then the customer does go ahead and do
15 it, but it might not be as automatic as we had thought
16 in terms of if it is economic a customer will do it.

17 Q. Would you be able to tell me, looking
18 at all three sectors, commercial, residential and
19 industrial, and all else being equal, could you point
20 to one of those sectors and say, "Its use of
21 electricity is more efficient than another sector?"
22 For example, residential is more efficient over
23 commercial, the industrial is more efficient over the
24 residential?

25 A. No, I think because energy is used

1 for different things in different sectors, I think that
2 would be very difficult to do. You might be able to
3 compare the amount of energy for space heating per
4 square foot in residential versus commercial, but I
5 think sort of across the board comparisons of that sort
6 wouldn't really be very useful or meaningful. I don't
7 think they could be done.

8 Q. Let me put a hypothetical situation
9 to you. Let's say, you could do that, you could make a
10 basis to compare sector to sector. And let's say it
11 turned out that the industrial sector was in fact more
12 efficient than the commercial and the residential
13 sectors, all else being equal. You'd agree with me
14 that when customers pay your Hydro rates, those rates
15 go into a general revenue pool. They don't come into
16 Hydro and say, "This will go into the industrial
17 account, this will go into the commercial account, this
18 will go into the residential account."

19 A. No, our cost model is based on
20 wholesale, retail break down.

21 Q. Right. And out of that general
22 revenue, that is where the demand management programs
23 are funded.

24 A. Correct, the same as all the
25 generating plants funded from those, the general

1 revenue.

2 Q. Would you agree that when the monies
3 are taken from the general account and allocated to the
4 various demand management programs among the three
5 sectors, they are not allocated 30 per cent will go to
6 the industrial sector, 46 per cent will go to the
7 commercial sector, and the remainder will go to the
8 residential sector?

9 A. No, our allocations really have been
10 in terms of programs which have been identified to be
11 cost-effective we are going to do. And that's the
12 whole basis of going after all the economic demand
13 management we can, everywhere we can get it.

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1 [12:33 p.m.] Q. Now, you agreed with me, Ms. Fraser,
2 that with respect to demand management programs,
3 participants benefit and non-participants pay.

4 A. That's why we have a broad menu of
5 programs across all sectors and almost across all end
6 uses now.

7 Q. Okay. Remembering my hypothetical
8 and what you have said about how demand management
9 programs are funded, if that hypothetical situation was
10 correct, that industry is more efficient, isn't there
11 the risk then that the industrial sector ends up
12 subsidizing the demand management programs of the
13 commercial and residential sectors?

14 MR. WILSON: A. Can I just make a brief
15 observation here.

16 I don't have the numbers for the long
17 term, but just if we take 1992 which is our current
18 plan for next year, we are planning to spend \$34
19 million in incentives in the industrial sector. That's
20 the largest sector. Commercial comes next at \$33.6
21 million, and residential comes third at \$27.4 million.

22 So, at least for next year, the
23 industrial sector is expected to receive more money
24 than the other two sectors.

25 MS. FRASER: A. That would be consistent

1 with the results that we found in our lighting program.
2 Although we have a program that covers industrial and
3 commercial in lighting and through the customized
4 incentive we pay \$500 a kilowatt, in actual fact, when
5 we average it out all together, that the industrial
6 projects get on average twice as much per kilowatt as
7 commercial projects, because we also pay per unit
8 incentives in the commercial, whereas industry was
9 converting to HID lighting which is quite capital
10 expensive, but the great operating savings which accrue
11 to the customers. The one part of the equation that
12 you haven't included so far is the energy savings that
13 result or the impact of time-of-use rates.

14 An example I have already used in these
15 hearings, Union Carbide, save an estimated \$850,000 at
16 one plant from time-of-use rates, from shifting some
17 use off-peak. I think those things have to be factored
18 in as well.

19 Q. Although if you go back to my example
20 on page 61 of Exhibit 76, we will see that over the
21 long haul, by the year 2015, the least amount of the
22 savings are in the industrial sector.

23 A. That doesn't include load shifting,
24 most of which is in the industrial sector.

25 Q. Notwithstanding the hypothetical I

1 put to you, the chairman of Ontario Hydro recently has
2 talked about the potential of 15 per cent rate
3 increases for the next three years.

4 MR. BURKE: A. I believe he said 14
5 percentage, and the first of the year has already
6 happened and it came out at 12.8.

7 Q. But over the course of three years.

8 MR. HARPER: A. 11.8.

9 Q. So over the course of the next three
10 years, it's still anticipated at least to be over 10
11 per cent per year?

12 MR. BURKE: A. Yes.

13 Q. If you assume that my hypothetical
14 situation about the cross-subsidy has some merit,
15 assume it has some merit, does Hydro know what such
16 rate increases along with a cross-subsidy like that, do
17 you have any idea what impact that would be on
18 Ontario's industries competitive position, having to
19 face those rate increases?

20 A. Well, I would think that the source
21 of the rate increase is not a factor which would affect
22 the competitive position. It is just a question of how
23 much do rate increases affect the competitive position
24 of Ontario Hydro -- of Ontario's industrial customers,
25 and I really can't say except to observe that for the

1 vast majority of industrial customers, while they are
2 large users, electricity still remains a fairly small
3 proportion of costs. There are certainly some
4 industries where the proportions get up to 10 and 15
5 per cent of costs. But on average in the industrial
6 sector, electricity is about 2 per cent of the value of
7 shipments.

8 So, that several per cent real changes in
9 electricity prices, while certainly going to the bottom
10 line, I would not be able to assess their impact alone
11 on competitiveness.

12 I would hazard that changes in the value
13 of the dollar from day-to-day have much more impact on
14 the competitiveness of Ontario industry than very large
15 price changes could, in electricity could have on
16 Ontario industry.

17 Q. So, could I translate that to say
18 that it is not a major concern to you about such rate
19 increases to industry?

20 A. We are not talking about large rate
21 increases associated with demand management.

22 Q. Well, generally also these over 10
23 per cent for the next three years?

24 A. Certainly it would be desirable not
25 to have increases that high.

1 What probably affects the competitiveness
2 more is the real price change and also how that
3 translates into U.S. dollars. The real price increase
4 over the next few years is of the order of 10 per cent
5 real in total for the next three years, and that is
6 definitely a noticeable change in real price of
7 electricity, but weighted against the share of
8 electricity and total value of shipments of the
9 industrial sector, I can't estimate exactly what the
10 impact would be on international competitiveness. My
11 sense is that it is, again relative to many other costs
12 elements that are changing, not a major change.

13 THE CHAIRMAN: I take it that that
14 response was dealing with the impact of rate increases
15 on the industrial sector. I didn't quite follow, Mr.
16 Rodger, how you are tying in this alleged subsidization
17 into that question. I couldn't figure that out.

18 MR. RODGER: Q. It was just to highlight
19 that if that hypothetical was correct, then not only is
20 industry being hit because they are helping to
21 subsidize demand management programs for the other
22 sectors and they are not getting a benefit --

23 THE CHAIRMAN: What do you mean by "hit"?
24 They are being hit through rate increases?

25 MR. RODGER: Yes. But part of the rate

1 increase goes to fund demand management projects
2 because it comes into the general revenue pool.

3 THE CHAIRMAN: But the
4 cross-subsidization has nothing to do with that, the
5 alleged subsidization has nothing today with that.

6 MR. RODGER: Well, it does in the sense
7 that if industry is 30 per cent of the Hydro load, it's
8 not getting 30 per cent of the demand management monies
9 in total over the long term.

10 MS. FRASER: That hasn't been determined.
11 You can't associate the savings with the load. As Mr.
12 Wilson indicated, that the expenditures that we see in
13 industrial are probably much more similar to the energy
14 consumption breakdown than they are what you have cited
15 in the year 2008 numbers.

16 MR. RODGER: Q. So you are saying that
17 although the long-term industrial savings are
18 substantially smaller in terms of megawatthours saved,
19 that the incentives to get those savings could be
20 just -- it could equal demand management program costs
21 in other sectors?

22 MS. FRASER: A. There are incentives
23 which may be -- some of them may be higher. The motors
24 program for example, which is primarily an industrial
25 program, has incentives around \$800 a kilowatt, which

1 is one of the higher, all the rest of them were sort of
2 starting out around \$300 a kilowatt.

3 The cost of doing consultant audits, we
4 do not do consultant audits in residential or
5 commercial; we do computerized based audits. In the
6 case of the residential the customer has to fill it out
7 themselves, in the case of the commercial one it's done
8 on a walk-through basis.

9 In industrial we do consultant audit
10 studies and some of those are quite dollar intensive.

11 We provide one on one field contact with
12 those large 200 customers, we don't have a field rep
13 for every one of the residential customers.

14 You have got to look at it in a whole
15 host of ways in order to determine some of the
16 questions that you seem to be interested in.

17 I think it all really goes back down to
18 the point that for all the customers in the province,
19 the more economic demand management we can achieve, no
20 matter where we achieve it, the better off we will all
21 be.

22 Q. Just to end on that, would you agree
23 that we may be all better off collectively, but not
24 individually?

25 A. I am not sure that we have enough

1 data at this at this point to determine all of the
2 winners and losers on various things.

3 With respect to time-of-use rates, it was
4 expected that all large users, commercial and
5 industrial, would be able to shift load. And with the
6 exception of some thermal cool storage projects in very
7 large office buildings, commercial customers have not
8 been able to shift load because they can't shift their
9 operating hours. In fact, time-of-use rates
10 represented basically a rate increase for large
11 commercial customers.

12 On the other hand, and back to the Union
13 Carbide example, \$850,000 a year saving from load
14 time-of-use rate impact.

15 Thermal cool storage, on the other hand,
16 in commercial also provides energy savings overall. So
17 in some of the time-of-use rate load shifting
18 applications in industrial may actually increase energy
19 use.

20 So, I think there is a whole host of
21 things that have to be looked at before you can
22 determine who are the winners and who are the losers in
23 this whole process.

24 MR. BURKE: A. One of the objectives of
25 balancing the demand and supply of electricity in

1 Ontario is to maintain a high reliability on the
2 system, so that all customers can benefit from a very
3 reliable electricity supply system.

4 So, that wherever electricity savings are
5 performed that are economic and contributes to the
6 reliability of the system, it's a benefit to all of the
7 customers, and that's something that's rarely
8 quantified and evaluated, what the benefit of
9 maintaining the reliability is. Essentially, it's a
10 benefit to all customers but doesn't usually enter into
11 the sort of dollar calculations that we have just been
12 having.

13 Q. I have couple of questions of
14 clarification regarding load shift being. I wonder,
15 Mr. Harper, if you could turn to page 7 of Exhibit 308,
16 which is AMPCO Interrogatory 4.24.91. I am not sure
17 what the next number is.

18 THE REGISTRAR: 261.55.

19 ---EXHIBIT NO. 261.55: Interrogatory No. 4.24.91.

20 MR. RODGER: Q. We asked you in this
21 interrogatory for a breakdown of the magnitude of load
22 shifting expected for various years, and the second
23 paragraph of your answer says that: "Targets by
24 program are not available beyond 1995."

25 Now, my point of clarification, if we

1 keep that answer in mind, if we go to page 39 of
2 Exhibit 304.

3 MR. HARPER: A. Yes.

4 Q. This is an excerpt from Exhibit 76,
5 Table 4.41, at page 67. You see that for net load
6 impact forecast of load shifting, there are figures
7 given for the years 1989 to 2015.

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1 [12:50 p.m.] I'm wondering how this Table 4.41 was
2 constructed, if there were no targets available beyond
3 1995.

4 A. I think from page 7 of your Exhibit
5 308, the reference there was to targets by specific
6 program. And the reason why there were no targets
7 available beyond the year 1995 is that we developed
8 targets on a program basis for our business planning
9 period. And the material that you have here reflects
10 the business planning period, it will be 1991 to 1995.

11 So that it is only within that time frame
12 that we actually go through the business planning
13 process of identifying specific programs and
14 identifying what are going to be the results of those
15 specific programs, which then provides the basis for
16 the individual budgeting and the targets for specific
17 years.

18 If you recall in my direct evidence, I
19 discussed the opportunities for load shifting within
20 Ontario Hydro, and how the 1,000 megawatts that we have
21 there for the year 2000 lined up against what looked to
22 be the potential we could achieve through time-of-use
23 rates. And it was on the basis that if we looked at an
24 application of time-of-use rates or perhaps other load
25 shifting programs, if time-of-use rates were not

1 extended to all customers, that it would be practical
2 to achieve 1,000 megawatts of load shifting by the year
3 2000 that the forecast was developed.

4 For the post-2000 period really, if you
5 will notice the numbers are fairly constant, and that's
6 really reflecting the fact that there is an annual
7 incremental load beyond the year 2000, which because it
8 doesn't have a 100 per cent load factor, creates an
9 additional opportunity, which you could take advantage
10 of for load shifting.

11 Q. I see after the year 2000, staying
12 with page 39, that there is quite a significant drop in
13 the annual amounts, and from 95 in the year 2000, and
14 35, and then downward after that.

15 A. Yes.

16 Q. And is that the reason for that drop?

17 A. Yes. I believe there was a specific
18 interrogatory from AMPCO on that which will explain
19 that.

20 MR. RODGER: Okay. Mr. Chairman, I'm
21 ready to start a new section. Would you like to take
22 the lunch break now?

23 THE CHAIRMAN: All right, we will break
24 now until 2:30.

25 THE REGISTRAR: This hearing will adjourn

1 until 2:30.

2 ---Recess at 12:54 p.m.

3 ---On resuming at 2:34 p.m.

4 THE REGISTRAR: Please come to order.

5 This hearing is now in session. Be seated, please.

6 THE CHAIRMAN: Mr. Campbell?

7 MR. B. CAMPBELL: Thank you, Mr.

8 Chairman. I believe there are two matters that the
9 witnesses have undertaken to find some information on,
10 and I'm going to ask first Mr. MacLellan to deal with
11 his, and then Mr. Burke.

12 And with the Board's permission, I have
13 to leave early this afternoon. I expect to depart
14 around 3:00, but Mr. Lane will be here, if that's
15 satisfactory.

16 MR. MacLELLAN: In reference to your
17 question, Mr. Rodger, about the number of certified
18 R2000 builders, the current number in Ontario is 381
19 builders. Now that doesn't include about the same
20 number again who have taken the training but for some
21 reason or other are no longer certified. You have to
22 either retake the course every two years, or be
23 actively building R2000 houses to retain your
24 certification. So the current number is 381.

25 Now, as I said in response to the

1 Chairman's questions, these tend to be small and medium
2 builders. These are people who build and market homes
3 individually, so they can do justice to the benefits,
4 the non-monetary benefits of R2000 such as air quality,
5 reduced noise level and increased comfort. The large
6 builders tend to build tract homes, and in particular
7 they tend to build in gas areas, so they are less
8 interested in the concept.

9 MR. RODGER: Thank you.

10 MR. BURKE: The matter I was coming back
11 on was the question of the administrative costs or
12 overhead costs of delivery of programs built into the
13 estimates of potential induced in Exhibit 76. Where it
14 says "Lifecycle Cost of the Various Measures," if the
15 measure is an existing residential thermal envelope
16 improvement measure, that is a thermal envelope
17 improvement measure in an existing residential house,
18 the amount that is built in is 20 per cent of the cost
19 of the measure. And that apparently is based on an
20 Oakridge National Laboratory study that was done in
21 1990 on the administrative costs of demand side
22 management.

23 And for the rest of the demand management
24 options, that is the remainder of the residential
25 sector, including new housing, and the commercial and

1 industrial sector, the amount is \$350 per kilowatt in
2 1990 dollars.

3 Also, I was talking with Mr. MacLellan
4 about the difference between the results on page 13 and
5 page 14 of Exhibit 304, and one thing that has emerged
6 from that is that in Exhibit 76, the results presented
7 there reflect the cost and energy savings associated
8 with moving from the 1986 building code to the R2000
9 level. Whereas, on page 14, the table giving the total
10 customer cost test and the other tests for program
11 design reflects a more up to data analysis, which goes
12 from the 1991 building code to the R2000 level. As the
13 cost has not yet been changed, we have about, instead
14 of a saving of 50 per cent from the '86 building code
15 to R2000 level, there is a saving of 35 per cent from
16 the 1991 building code to R2000 level.

17 If that is at the same cost, that
18 accounts for why the benefit cost ratio appears to be
19 closer together. I think you may recall that Mr.
20 MacLellan suggested that there was a possibility
21 that -- not a possibility, but there was evidence
22 emerging that the costs, in fact, for R2000 upgrades
23 from the 1991 building code would, in fact, be lower
24 than the \$6,000 amount. But that has not been taken in
25 to account yet in the analysis presented on page 14.

1 So I think what the inconsistencies may
2 be due to the fact that this is an updated analysis,
3 but not everything has been updated completely in
4 parallel.

5 MR. RODGER: Q. Would I be correct Mr.
6 Burke, if I say that the reason why the savings have
7 gone down from building code to building code, is
8 because with each progressive step the building code is
9 become more comprehensive and therefore less savings
10 can be realized?

11 MR. BURKE: A. Yes, relative to the
12 R2000 level, that's correct.

13 MR. RODGER: Thank you.

14 Mr. Chairman, assisting me this afternoon
15 is Mr. Don Nevison.

16 Q. If I could return to one matter that
17 was discussed before the break, and this was the
18 financial impact of demand management, perhaps I can
19 clarify the points I wanted to make, and perhaps I just
20 wasn't as clear as I was. I think I can do it very
21 quickly.

22 Ms. Fraser, you will agree with me that
23 the rate impact measurement of demand management is
24 negative. That is, at least for the short term, rates
25 will go up because of demand management measures, is

1 that correct?

2 MS. FRASER: A. Yes.

3 Q. And everybody, regardless of what
4 sector they are in, industrial, commercial or
5 residential, everybody is going to pay higher rights.

6 A. The rates will go up, but their bills
7 will go down to the extent that they participate in
8 programs.

9 Q. Okay, I want to get to that. But in
10 the immediate term everybody pays higher rates.

11 A. That's right, the rates go up.

12 Q. Would you also agree that not
13 everybody gets the same incentives with the various
14 demand management programs?

15 A. Yes. The incentives vary and the
16 energy savings vary by technology, by location.

17 Q. Would you therefore agree with me
18 that the individuals who get more incentives are
19 winners, relatively speaking, as compared to the
20 individuals who get less incentives, because their
21 rates go up, but they don't get the same amount of the
22 incentives as the "winners" get?

23 A. No, I don't think the incentives are
24 the determining factors of winners or losers.

25 Q. So you disagree with that last point.

1 A. Yes.

2 Q. I will just leave it with that then.

3 I'd like to take a look at the Ontario
4 government link in this demand management chain, we
5 have talked about it a lot so far. There is just one
6 area of clarification I'd like to get from you.

7 In Volume 48, page 8766, I don't think
8 you have to turn to it, I just want to give you a small
9 quote of Mr. Wilson with respect to new standards. And
10 it was your testimony that:

11 "It's Hydro's expectation that the
12 kind of stringent measures that we are
13 visualizing can be put in place by 1995."
14 And this was with respect to new
15 government initiatives, new legislation.

16 Is that correct, Mr. Wilson?

17 MR. WILSON: A. I think I was discussing
18 Scenario C, or Case C, and yes, that is correct.

19 Q. Now, Mr. Burke, you also discussed in
20 your direct evidence, with respect to implementation of
21 new measures on appliance manufacturers, you said that
22 they would probably need a two or three-year lead time
23 to get up to speed. Do you recall that testimony?

24 A. Yes.

25 Q. The clarification that I am seeking

1 is what's your time line here in terms of government
2 legislation being put in place, and at the same time
3 giving these appliance manufacturers enough lead time
4 to get ready for that change? If you say that new
5 legislation will be in place by 1995, when does the two
6 or three-year lead time start for the appliance
7 manufacturers, to get them ready for it?

8 MR. MacLELLAN: A. It actually started
9 about a year ago. The Ontario government set up the
10 Appliance Efficiency Act about a year ago. The initial
11 regulations were fairly base level and didn't cut out
12 many products. They are setting up 1992 regulations
13 that will be more stringent, but the large gain will be
14 made in 1994. At that point, the regulations will be
15 the same as the 1993 U.S. Department of Energy
16 regulations. And the appliance manufacturers have
17 known for at least a year what those levels would be,
18 and they have actually been given three to four years
19 to meet those levels.

20 Q. So am I correct then that Hydro's
21 expectation is that by 1995, when the new legislation
22 comes into place, at that time the appliance
23 manufacturers will already be up to speed and be ready
24 to --

25 MR. B. CAMPBELL: Mr. Chairman, I don't

1 believe that any of the witnesses have suggested that
2 new legislation is required. There might be increased
3 regulations under the existing legislation I think is
4 what has been testified is contemplated.

5 MR. RODGER: Q. I think Mr. Campbell is
6 quite right. I was referring to regulations.

7 MR. MacLELLAN: A. Yes. In the
8 appliance area the magic date is January 1, 1994. It
9 is earlier than '95.

10 Q. Thank you.

11 MR. BURKE: A. I think I should add
12 something to Mr. MacLellan's testimony, in the sense
13 that the standards envisaged in Case C, go beyond the
14 ones that are currently recognized in the 1990 basic
15 load forecasts and include the movement to U.S.
16 appliance efficiency standards in '94.

17 So that effectively, I think, there are
18 new regulations that would be entailed, in addition to
19 the ones that are currently not only part of the
20 appliance -- the Energy Efficiency Act now, but are
21 also in a class that we considered sufficiently well
22 understood to include in the 1990 load forecast. And
23 those would have to come fairly soon in order to meet
24 the 1995 date.

25 So, effectively, there are two groups.

1 There are the standards that are currently anticipated
2 and known, as Mr. MacLellan described, and then there
3 are further standards still that would be required for
4 Case C. Those have yet to be determined but would have
5 to be, I would suggest, in the next year or two.

6 Q. In the next year or two. All right,
7 thank you.

8 I have a few questions regarding the
9 municipal utilities.

10 Ms. Fraser, you have said on a few
11 occasions now that the over 300 municipal utilities are
12 a very, very important link to energy consumers in
13 Ontario, and to the successful implementation of the
14 Hydro demand management plan. Correct?

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...

1 [2:45 p.m.] MS. FRASER: A. Yes.

2 Q. Am I correct when I say that
3 approximately 70 per cent of the electricity sold in
4 the province is delivered through municipal utilities?

5 A. Yes, that's the ballpark number we
6 use.

7 Q. Okay. Am I also correct when I say
8 that there are three types of sales of electricity that
9 Hydro is involved with, there are direct sales to
10 customers, there are sales to the municipal utilities,
11 and there are export sales?

12 A. Yes, assuming that the direct sales
13 to customers include our retail.

14 Q. Yes, I took that.

15 A. As well as what we call direct
16 customers.

17 Q. Yes. I understand that the municipal
18 utilities, they get there revenue by marking up the
19 electricity? The electricity is delivered to the
20 municipal utilities, the utilities mark it up and then
21 it goes off to the final customer?

22 A. I believe that it is not so much a
23 mark-up as it includes the distribution costs, are then
24 added on.

25 Q. I take it that distribution costs

1 vary from municipal utility to municipal utility?

2 A. Yes.

3 Q. And is that money that the municipal
4 utilities get, the distribution costs, is that their
5 only revenue stream?

6 A. You are into territory that I am not
7 as familiar with as my colleague, Mr. Harper, so I will
8 pass it on to him.

9 MR. HARPER: A. No, not really.

10 I guess it depends how you define
11 revenue. Municipal utilities essentially have three
12 sources of cash: The revenue they collect from their
13 customers; they borrow funds, or thirdly, a number of
14 them will take contributed capital when developers come
15 in and want to build new subdivisions. So there are
16 really three sources of money.

17 But in a strictly revenue sense, I guess
18 the sale of power is their only source of revenue.

19 Q. I didn't quite get your last point.
20 The revenue from the customers, they borrow money?

21 A. And contributed capital, or capital
22 contributions.

23 Q. I see. Now, we have also heard
24 through your direct testimony that Hydro has no
25 legislative control over the MUNIES, although I do

1 understand that Hydro does control the rates that
2 MUNIES can charge the customers; is that true?

3 A. Yes. There are certain aspects of
4 their operation for which they have to get approval
5 from Hydro and those are set out specifically in either
6 the Power Corporation Act or or the Public Utilities
7 Act.

8 Q. Am I correct when I say those include
9 the rates that can be charged and also the amounts that
10 can be spent on capital works?

11 A. Yes. They require approval from
12 Hydro for any rates, rents or charges, and also for
13 expenditures on capital, i.e., over and above normal
14 operating expenses.

15 Q. I would like to take a look at what
16 has been achieved to date between Hydro and municipal
17 utilities with respect to implementing the demand
18 management plan.

19 Ms. Fraser, you spoke in your direct
20 testimony that you were one of two representatives on
21 the MEA's demand management committee; is that right?

22 MS. FRASER: A. Correct.

23 Q. What is the mandate of this
24 committee?

25 A. The committee basically looks at the

1 whole issue of demand management from the municipal
2 utility's point of view. It reviews Hydro's demand
3 management programs; it entertains discussions of
4 issues with respect to demand management generally; it
5 is a forum, for instance, when the provincial
6 government was contemplating banning the use of
7 electricity for space and water heating, the staff from
8 the Ministry of Energy came and made a presentation and
9 gathered input from the Municipal Electric Association.
10 That type of work.

11 Q. Is that the primary body or the
12 primary link between Hydro and the municipal utilities
13 with respect to demand management, this committee?

14 A. Well, no there has been another task
15 force established for the large utilities that is being
16 coordinated by Municipal Electric Association as well.
17 There is also representation at, I believe, the
18 vice-president level from the customer service division
19 which sort of oversees, and I believe both the
20 directors in the energy management branch sit on that
21 committee as well.

22 Q. Now, who is the other Hydro
23 representative on this demand management committee, is
24 that from energy management branch?

25 A. Yes, that's the manager of the

1 program testing and analysis group.

2 Q. Could you tell me what has been
3 achieved at this committee to date in terms of
4 implementing demand management measures?

5 A. This committee was first formed late
6 in the fall of last year. As an example, when we were
7 in commercial revising savings by design and the
8 lighting program and thermal cool storage, we started
9 with that committee, to get their input on what kind of
10 changes they would like to see in the program and how
11 the program was working from their perspective. We
12 have reviewed other programs since then, both the
13 residential group bring their programs, the commercial
14 group and the industrial group with respect to programs
15 that will be affecting municipal utility customers,
16 they have entertained discussions on a number of topics
17 with respect to demand management. A variety of
18 issues.

19 I haven't been in attendance at the
20 meetings since I have been on hearings duty with both
21 the OEB and this one. So, my stand-in has been doing
22 duty there.

23 Q. How often does this group meet?

24 A. I don't think it's as regular as
25 month to month, but it's certainly more often than once

1 a quarter.

2 It sort of meets when there is a full
3 enough agenda to deal with issues to bring people in
4 from the various parts of the province.

5 Q. Okay. I wonder if I could ask you to
6 turn to page 12 of Exhibit 308, which is Interrogatory
7 No. 4.24.7.

8 I have lost track the of what the number
9 next number is.

10 THE CHAIRMAN: Probably 56.

11 MR. RODGER: 56, thank you, Mr. Chairman.

12 MR. B. CAMPBELL: Is this 4.24.7?

13 MR. RODGER: Yes.

14 MR. B. CAMPBELL: I believe it already
15 has a number, 261.40.

16 MR. RODGER: Thank you.

17 Q. I believe that Mr. Harry Poch already
18 referred to this AMPCO interrogatory in his
19 cross-examination, so I don't want to go over ground
20 that's already covered.

21 Attached to this interrogatory are a
22 series of resolutions which the MEA passed, and many of
23 them are with respect to demand management. Would you
24 agree with me, Ms. Fraser, if I summarize the
25 resolution that the MEA is committed to the concept of

1 demand management in principle and very supportive of
2 Hydro's efforts in general, but there does seem to be a
3 lack of a firm commitment by municipal utilities to
4 specific overall targets, for example, a target of
5 achieving a 15 or 20 per cent reduction in electricity
6 use, for example. Would that be fair?

7 MS. FRASER: A. There is more than one
8 resolution here. First of all, there is, I think,
9 three different years of resolutions that, yes,
10 generally support the -- these are resolutions from the
11 annual membership meetings of the MEA. The MEA itself
12 cannot commit to targets on behalf of the individual
13 utilities.

14 At this point, you are right, we have not
15 established specific targets utility by utility. We
16 have, within Hydro, established targets field office by
17 field office, and they will then take those results and
18 work with their local municipal utilities in terms of
19 finalizing those.

20 Also attached to Interrogatory 4.24.9 are
21 samples of formal agreements that we have where there
22 might be specific targets on a program basis or
23 specific commitments on a program basis that would be
24 important to tie down in a written format.

25 In addition, this task force with the 30

1 large utilities that's being coordinated by the
2 Municipal Electric Association, part of that process
3 may include the assignation of targets depending on
4 what has developed, but that's still to be negotiated.

5 Q. I want to get to those agreements in
6 a minute. And to be fair to the MEA, they have no
7 direct authority or control over the individual
8 municipal utilities.

9 A. No. It's an association.

10 Q. Just as AMPCO has no direct control
11 over its individual member companies.

12 Although I do see that from the response
13 to Interrogatory 4.24.7, the first line of the
14 interrogatory, it states that Hydro and the municipal
15 utilities have not set EEI targets for individual
16 utilities.

17 Does that remain the case today, or are
18 these field offices and their contacts, does that
19 change that situation?

20 A. No, that's still true as a general
21 statement.

22 I think where there a particular program
23 like the water heater wrap program, then there are
24 targets set for particular duties, not so much with
25 respect to megawatt savings.

1 Q. Okay. You also testified, Ms.

2 Fraser, that Hydro is negotiating right now with top 30
3 utilities to develop a memorandum of understanding
4 about how the municipal utilities and Hydro are going
5 to work together. I believe you said you hoped to take
6 that model of relationship-building down to the sort of
7 medium-sized utilities; correct?

8 A. Yes. I am not sure there will be one
9 memorandum of understanding for all 30 large utilities,
10 that there may actually be 30. I am not sure. That I
11 don't think has been...

12 Q. Would it be fair to say, Ms. Fraser,
13 that while directionally Hydro and the municipal
14 utilities are doing a lot to get involved in demand
15 management, it's still at the very, very preliminary
16 stages in terms of how you are going to actually
17 implement demand management programs with the municipal
18 utilities.

19 A. Well, what we haven't discussed yet
20 are the activities of individual municipal utilities
21 that have been worked out either jointly or just as
22 part of, you know, given the direction, the general
23 consensus at the association level to support municipal
24 utilities. There is a whole host of activities
25 undertaken by municipal utilities in support of our

1 programs, everything from commercial/industrial
2 customer seminars to participation in specific
3 programs. There is lobby displays, they process
4 applications in the lighting program, they -- it varies
5 as I indicated in my direct from utility to utility,
6 based on their size, based on the inclination of the
7 management at the utility, and so on.

8 For instance, Espanola Hydro is deeply
9 involved in the Espanola project, just as they were
10 very involved in making us build the first town to
11 adopt high efficiency street lights into the pilot
12 program.

13 Q. You mentioned certain agreements that
14 Hydro and the municipal utilities have entered into.
15 If you turn to page 14 of Exhibit 308, and that's
16 Interrogatory 4.24.9.

17 I don't believe this one has been given a
18 number yet.

19 THE REGISTRAR: 261.56 is the next one,
20 Mr. Chairman.

21 --EXHIBIT NO. 261.56: Interrogatory No. 4.24.9.

22 MR. RODGER: Q. And attached to that
23 interrogatory is an agreement with respect to electric
24 water heater tune up programs.

25 MS. FRASER: A. Correct.

1 Q. And as well, there is an energy
2 management program with Kitchener/Wilmot Hydro.

3 A. Correct.

4 Q. Now, I wonder if you could also turn
5 to page 41 of Exhibit 304. And this is taken from the
6 Ontario Hydro statistical year-book for 1989.

7 THE CHAIRMAN: Did you say 41?

8 MS. FRASER: Sorry, mine ends at page 40.

9 MR. RODGER: It's page 40. Thank you.

10 Q. And this lists the top 30 or 40
11 municipal utilities in the province in terms of total
12 sales, total revenue. I wonder if you could tell me,
13 Ms. Fraser, this type of agreement, the
14 Kitchener/Wilmot Hydro energy management program, how
15 many types of this agreement has Hydro entered into
16 with these top 40 or so utilities as seen on this page
17 40?

18 MS. FRASER: A. I'm not sure. I know
19 that there is one with Guelph as well and that was
20 attached to interrogatories that we used at the Ontario
21 Energy Board hearing.

22 What I haven't done at this this point is
23 canvassed all of our field offices to ask them if there
24 are specific agreements with municipal utilities.

25 I believe that London has one, Windsor,

1 Oshawa. It's certainly something that our field
2 offices are working on. So how many are actually in
3 the completed stage versus how many are in negotiation
4 stage, I am not sure at this point.

5 Q. How about in the Metro Toronto area?

6 A. The working relationships developed
7 there I think have developed over a longer period of
8 time. As you notice, the Kitchener/Wilmot one, it has
9 some very basic kinds of strategies and principles and
10 roles and responsibilities.

11 Q. Maybe if we could just take a look at
12 that, if you could take us through it.

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25 ...

1 [3:03 p.m.] A. Yes. I would point out, first of
2 all, that both Guelph and Kitchener, Wilmot are two
3 utilities that have a brand new customer energy service
4 office and a new customer energy service manager
5 managing that office.

6 As Mr. MacLellan indicated, that we have
7 expanded that range. And so where Guelph and Kitchener
8 did not get as much attention before when they were
9 part of, I guess part of our central region, which
10 focused on the large municipal utilities, so that they
11 thought it was very important in the start-up process
12 to set the ground rules, and that's basically what this
13 document does. It starts with the guiding principal in
14 terms of customer satisfaction, overall benefit to the
15 community, in order for the strategies and the
16 initiatives.

17 It goes through sector by sector in terms
18 of the industrial strategy, detailing how they are
19 going to target various customers, whether they are
20 going to be proactive or reactive, what kind of tactics
21 they are going to use in terms of direct mail, phone
22 calls, and using various tools or programs that are
23 provided, such as the power savers audit program. And
24 then the importance of communicating both the benefits
25 and the savings from energy management to other

1 customers, to encourage them to participate and to
2 encourage other customers to participate.

3 Q. I see as well that there is also a
4 monitoring and reporting aspect to these, whereby
5 monthly reports are provided to the utility who enters
6 into these agreements regarding customer activities
7 undertaken by Ontario Hydro. So it seems to be an
8 ongoing relationship.

9 A. That's right, yes, back and forth.
10 Setting up the delivery rolls in terms of who is
11 contacting what customers when, so that we are not, you
12 know, either tripping over each other or making -- not
13 missing things.

14 Q. I appreciate that you can't give me
15 this answer today, but I'd be interested in finding out
16 how many of the top forty utilities either have entered
17 into this agreement or a similar agreement, or who
18 Hydro is currently negotiating with.

19 A. Well, we are negotiating with the top
20 thirty right now. So you want to know what we are
21 doing with the other ten, top ten?

22 Q. Yes, I just want to get some feel of
23 what the status is with these. Are they all coming on
24 board or --

25 A. I think as I was going to point out

1 when you asked about Metro and then went into the
2 specifics here, and I was contrasting a relatively new
3 territory essentially, in a way in which the customer
4 service manager approached the importance of getting it
5 documented, and versus a more longstanding relationship
6 that has evolved over time.

7 Same with the metro utilities. There is
8 the Metro Utility Marketing Committee, and they deal
9 with a lot of these issues, and a lot of these
10 relationships have been worked out. And some of those
11 I don't think have felt the same need to document to
12 the same degree. So I won't be surprised if our all
13 top thirty don't have existing ones with field offices,
14 particularly given that as we started seeing the value
15 in doing this from the field office, we also came at it
16 from the corporate side of it with respect to this
17 large utility task force that's been set up last
18 February.

19 Q. Is it your view that agreements of
20 this type that we have been discussing, they would go a
21 long way to implement various aspects of Hydro's demand
22 management plan?

23 A. I think they will improve our ability
24 to deliver demand management.

25 Q. Is Hydro encountering any resistance

1 amongst any municipal utilities in getting involved in
2 agreements such as this with Hydro?

3 A. Well, I think, as I indicated in my
4 direct, there is a range of support based on capability
5 and orientation of particular utilities.

6 I think by and large what I did do in
7 preparation for this, for my appearance here, was write
8 to our field managers and ask them for examples of
9 issues where either things were going very well or
10 things weren't going well at all, and by and large I
11 got virtually none of the latter, with the exception --
12 I had a couple of exceptions of, you know, there is one
13 utility that has a slogan on their letterhead that
14 losing electricity creates jobs in Ontario, and if some
15 people --

16 Q. Who is that utility?

17 A. Well, it's on their letterhead, so I
18 guess they must be proud of it. It's Newmarket Hydro.
19 And so to the extent that that could be seen to be some
20 sort of load building approach, that's not the approach
21 that they have -- they do not promote load building,
22 although that is there slogan on their letterhead. I'm
23 not sure how long it has been there.

24 But by and large the response that I got
25 back in that not very informal survey, there was

1 nothing statistically sophisticated about it, was
2 pretty positive. And even though I'm fairly close to
3 what has been going on at field office levels, I was
4 amazed once I put it all together and sort of took a
5 look at the, you know, the seminars here, different
6 projects, "The Kill-O-Watt Project" that was done in
7 Marmora.

8 The Hydro commissions themselves have
9 been very active in renovating their buildings.
10 Brampton Hydro is building a new building that they
11 have been able to shave over half a megawatt off their
12 peak using solar collectors and a ground source heat
13 pump. And different municipal utilities are also
14 hiring field staff. North Bay, for instance, has hired
15 two energy advisors.

16 Q. So the vast majority of response to
17 date has been positive?

18 A. Yes, I think of the large and medium
19 size ones. The small ones I don't think can really
20 mount that kind of effort.

21 Q. Now, Ms. Fraser, in your direct
22 evidence you stated on page 8,900 that you are not
23 familiar with any municipal utilities' specific demand
24 management programs in terms of providing incentives.
25 Do you recall that?

1 A. Yes, vaguely.

2 Q. Does the cost of Hydro's demand
3 management programs include the cost to the municipal
4 utilities of implementing those programs?

5 A. When we do the total customer cost
6 test analysis, that's included both at the screening
7 level and the program level. Where there are costs to
8 be specifically borne by the municipal utilities, for
9 instance the water heater tune-up program, those costs
10 are included in the program, and the municipal
11 utilities are reimbursed.

12 Part of the negotiations in that large
13 utility task force will be how to do that in a more
14 broad -- broadly-based way, rather than negotiating on
15 a program-by-program basis.

16 Q. Do you know if there is a concern
17 among municipal utilities that one of the consequences
18 of demand management will be less revenue for the
19 municipal utilities, and therefore less money to meet
20 their operational expenses? Has that been a concern?

21 A. Yes, and I think we had some
22 discussions, and I have forgotten with which counsel it
23 was now, with respect to this issue. And that point, I
24 think we put forward that -- the idea that the net
25 revenue issue has not been a large factor in the

1 discussions with respect to the large 30 municipal
2 utilities.

3 In addition, if you look at the -- all
4 the approved programs in the program concept reference
5 document, and you look at the distributor rate impact
6 test, in actual fact the net present value of our
7 current programs is such that the municipal utilities
8 on average come -- in total, I should say, come out
9 \$185 million to the good. And this was recognized in
10 this year's final report of the Ontario Energy Board as
11 well.

12 Q. So in fact your view anyway is that
13 the demand management efforts will be a bonus for
14 municipal utilities as opposed to a detriment, in terms
15 of revenue over the long haul?

16 A. In terms of their avoided cost, and
17 that's what the distributor rate impact test measures.
18 It is not just a revenue issue. It is also their
19 avoided distribution costs. And quite frankly, given
20 that a lot of the municipal utilities finance
21 distribution costs out of operating costs, I don't
22 think it is surprising that they don't necessarily look
23 at avoided distribution costs as -- like it is never
24 cash in their hand. So it is not something that they
25 are going to see.

1 Q. I wonder if you could turn to page 15
2 of Exhibit 308? And this has already been entered as
3 an interrogatory. It is 261.51, and that's AMPCO
4 interrogatory 4.24.11.

5 And if you go over to Hydro's response
6 right at the bottom of the page, Hydro states that:

7 "Estimates of municipal utility
8 spending on demand management are not
9 available."

10 A. Correct.

11 Q. Can you tell me, Ms. Fraser, do you
12 know if any of the municipal utilities have prepared
13 demand management budgets to date?

14 A. I have no knowledge with respect to
15 that. Different utilities have, you know, customer
16 service budgets. If they would characterize some of
17 those as demand management activities, I'm not sure.

18 Q. So you are not aware of any.

19 A. I haven't seen them. I don't see
20 their budgets.

21 Q. Are you aware, Ms. Fraser, of any
22 municipal utilities that have recently increased their
23 staff specifically for the area of implementing demand
24 management measures?

25 A. I just mentioned North Bay has hired

1 two energy efficient advisors, St. Catharines has, I
2 believe Toronto Hydro has in the past two or three
3 years.

4 Q. Has any of the municipal utilities
5 raised the following issue with you? And that is what
6 if Hydro were to pay the municipal utilities for every
7 negawatt, that's with an N, of savings?

8 A. Yes, I know what a negawatt is.

9 Q. How has that debate gone, if at all
10 today?

11 A. When I presented the Guaranteed
12 Energy Performance Program, which basically does that
13 for energy service companies which generate savings,
14 and we pay them on the basis of kilowatthours saved, I
15 was asked at that point if municipal utilities could
16 participate in -- be seen as energy service company.
17 At that time I went back and checked to see if legally
18 they could, and they could.

19 To the extent that they could comply with
20 the requirements of the program, which in some ways are
21 in there in order to make sure that we don't have a lot
22 of fly-by-night operators becoming energy service
23 companies, because it is a very sophisticated kind of
24 business to be in, so there is a certain of history and
25 what not that they have to be able to demonstrate.

And I indicated, went back to them and indicated it certainly was possible, but at this point we have not, you know, either proactively gone out to seek municipal utilities to behave and act as energy service companies and none have approached us either.

Q. So that issue is still open, and the discussions are ongoing.

A. Yes, there is numerous utilities in the U.S. which have created subsidiaries as energy service companies. Some of them have created them and sold them off. Some of them have not created them and purchased them. So it is an interesting process, interesting business.

Q. Just one question now with respect to fuel switching. And that is, given the vast scale that fuel switching contemplates, it is not only consumers that are being encouraged to switch to gas, but the non-utility generation will be fueled by gas, and Ontario Hydro CTUs that may be brought on stream, they will be run by natural gas.

...

1 [3:20 p.m.] Has Hydro considered what new risks the
2 province faces by being more and more dependent on gas
3 supply, be it pipeline capacity, long-term gas prices,
4 that type of thing?

5 MR. WILSON: A. The question, I believe,
6 will be addressed as part of the rebalancing of the
7 Demand/Supply Plan by Christmas of this year.

8 Now, as you have just pointed out, there
9 are many ramifications: Our own generation,
10 non-utility generation, and fuel switching in the
11 demand management plan.

12 So, it's a question that we will be
13 looking at.

14 Q. So that's Panel 11?

15 A. I expect Ontario Hydro will introduce
16 something to the Board and to the intervenors by the
17 end of this year. I think the opportunity for
18 cross-examination will likely be Panel 11.

19 Q. All right, I will wait.

20 Okay, I am going to wrap up and I want to
21 do so by putting another hypothetical situation to you.

22 We are now in the year 2000, and, Mr.
23 Burke, your upper load forecast, that turns out to be
24 correct; however, your expectation that upper load
25 forecast will yield more demand management, that turns

1 out to be incorrect, and we don't have to worry about
2 the reasons right now, but through no lack of good
3 faith or effort on the part of Hydro, you just don't
4 achieve the continent's most ambitious plan of
5 consumption control in the next eight years. You fall
6 short on that mark.

7 In fact, what happens in this
8 hypothetical is that you only achieve a quarter to the
9 third of the demand management savings that is now
10 contemplated.

11 My question is: In that situation what
12 are Hydro's contingency plans and when does Hydro have
13 to start to put them in place to ensure that the
14 province doesn't run out of power?

15 MR. SHALABY: A. I am not sure whether
16 that's again more appropriately dealt with in the
17 integration of the plans, the sub plans into a full
18 story, but the line of response would be to place short
19 lead time measures into service. To go to more NUGs,
20 for example, we will request more bids from NUGs.
21 There is going to be perhaps a short deterioration in
22 reliability. There will be many things that will
23 happen.

24 But the contingency plans as submitted
25 in the demand supply plans come under combustion

1 turbines, gas-fired combustion turbines that can be put
2 in place in a short period of time, and that's part of
3 this application.

4 Q. And those short lead times are, I
5 believe, four to six years, based on the Panel 2
6 estimates?

7 A. In that ballpark, yes.

8 Q. Perhaps I will wait until Panel 11
9 then, and I might ask that again.

10 A. Yes.

11 Q. Now, we are involved in an
12 environmental assessment here, as we all know, but the
13 key word being "environment". I would ask the members
14 of the panel, do you know how "environment" is defined
15 in the Environmental Assessment Act? Have you ever
16 taken a look at that?

17 MR. LANE: Is this something that the
18 panel members should be expected to know, Mr. Chairman?
19 What is the purpose of the question?

20 MR. RODGER: Well, we are in an
21 environmental assessment, I would have presumed that
22 you would have taken a look at that.

23 I would be happy to point out one
24 particular part of the definition to you.

25 MR. SHALABY: I have taken a look.

1 THE CHAIRMAN: I expect they do know, but
2 why don't you refresh their memory by reading what it
3 says.

4 MR. RODGER: I would be happy to.

5 Q. There is just one section I want to
6 refer to, one part of that definition, and that is,
7 environment means the social, economic, and cultural
8 conditions that influence the life of man or community
9 in or of Ontario.

10 Now, a number of intervenors since this
11 case began have talked a lot about externalized social
12 costs, and, Ms. Fraser, I want to put this question to
13 you since you are familiar with the industrial sector.
14 Would you agree that given that a reliable electricity
15 supply is really the life blood of Ontario industry,
16 that it is essential for this process to consider the
17 economic and social costs of not having a reliable
18 electricity supply, that is the cost of running out of
19 power?

20 MR. SHALABY: A. This is part of the
21 submission that we have. We fully recognize the
22 meaning of the environment as in the Environmental
23 Assessment Act, and the application speaks about the
24 natural, the cultural, the economic, and all aspects of
25 the electricity service equation.

1 The shortfalls in electricity supply do
2 cost consumers money and we recognize that by providing
3 a reliability reserve. If we think we need to serve
4 23,000 megawatts of peak, we make sure that we have on
5 line something like 28,000, for example. We put a
6 little more because we know that some of our equipment
7 will break down and customers cannot be without
8 electricity for too long. That's the whole reliability
9 equation.

10 So, it's a balance between keeping enough
11 reserve to guard against shortfalls, so that enters
12 into the electricity planning exercise.

13 Q. And it is true, though, Mr. Shalaby,
14 that Hydro keeps no historical analysis on the cost to
15 industry of power interruptions?

16 A. It is true that...?

17 Q. That Hydro keeps no historical
18 analysis of the cost to industry of power
19 interruptions?

20 THE CHAIRMAN: That's really not a demand
21 management question.

22 MR. RODGER: Q. So, back to my question
23 about the externalized social cost and the hypothetical
24 of if you don't achieve those demand management
25 results, is that something that should be incorporated

1 in that broad term of "environment" as it impacts on
2 the demand management aspect of this hearing?

3 MR. SHALABY: A. Well, we see it more as
4 incorporated in the reliability question, the
5 obligation to serve customers, availability of our
6 product when required.

7 I don't know how you want to put it into
8 the environmental equation, I am not sure. But we do
9 recognize the hardship that would be incurred by
10 others, by customers, if electricity is not available
11 when they need it, we recognize that.

12 MR. RODGER: I think those are all my
13 questions. Thank you, Mr. Chairman.

14 Thank you, panel.

15 THE CHAIRMAN: Thank you, Mr. Rodger.

16 We will adjourn now until Monday morning
17 at 10:00 when the cross-examiner will be....

18 MS. MORRISON: Pollution Probe, I think,
19 will be the first one.

20 THE CHAIRMAN: Pollution Probe will lead
21 off.

22 MS. MORRISON: And IPPSO second.

23 THE CHAIRMAN: Followed by IPPSO.

24 THE REGISTRAR: This hearing will adjourn
25 until 10:00 Monday morning next.

1 ---Whereupon the hearing was adjourned at 3:28 p.m., to
2 be reconvened on Monday, September 23, 1991, at
3 10:00 a.m.
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